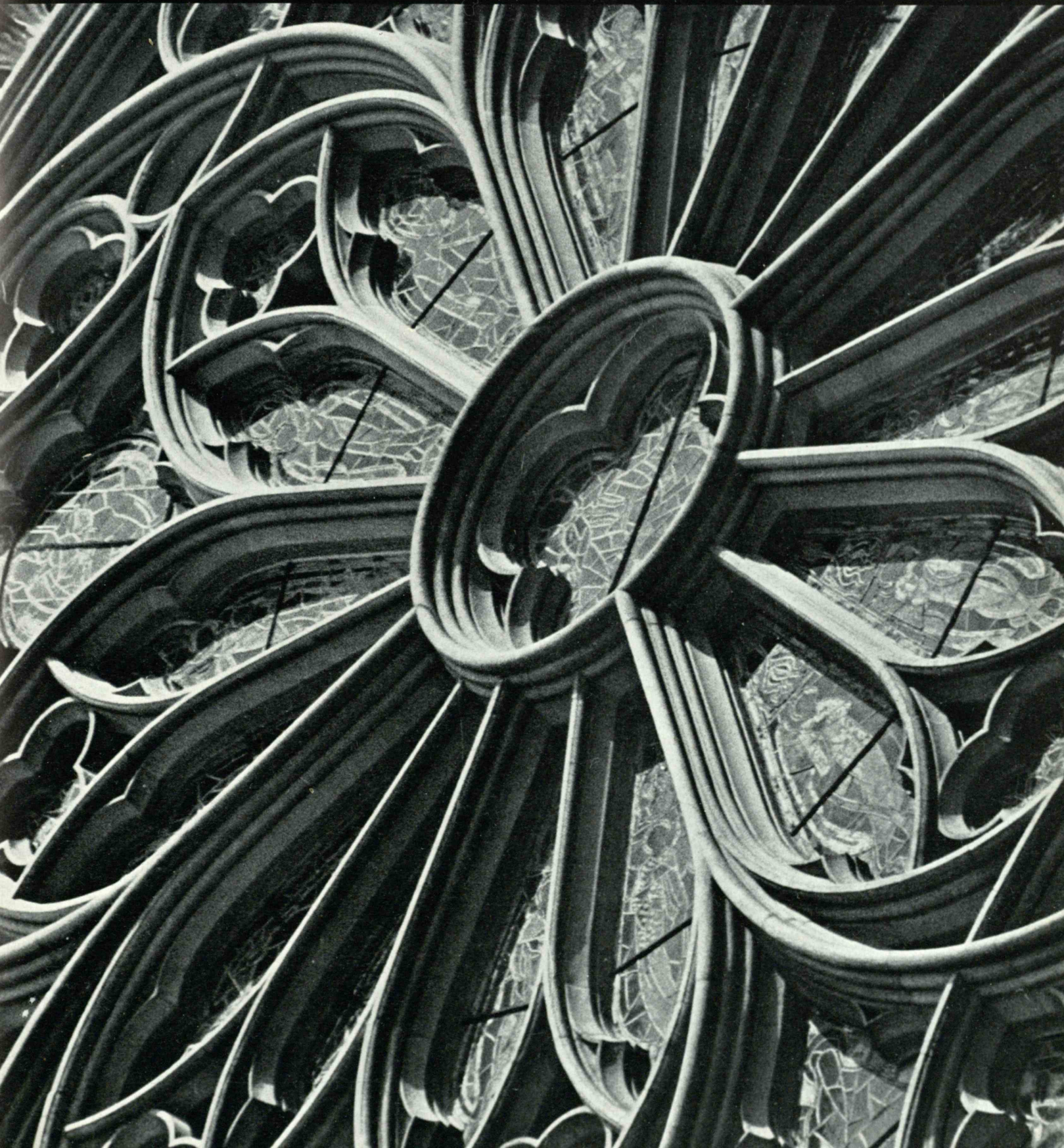


June 1939

TECHNOLOGY REVIEW

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technology review

Published by MIT

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THE TABULAR VIEW

RETURNING to America after 20 years in Japan, where he went with Frank Lloyd Wright in 1919, ANTONIN RAYMOND brought back extraordinary experience from which an extraordinary mind has distilled philosophy and theory illuminating to those who see in Modern architecture invitation to a better future. During his sojourn in the Orient, Mr. Raymond became the chief modern builder of Japan, and became also unassuming pupil of carpenters and workmen possessed of skills and intimate knowledge of materials derived from a tradition differing far from that of the Occident whence the pupil sprang. Mr. Raymond was born in Bohemia, served the United States as an assistant military attaché in Switzerland, was an engineer-architect with the late Cass Gilbert, '80. Out of this fusion of inheritances comes his stimulating philosophical justification of Modern architecture (page 349). ❑ SYDNEY E. INGRAHAM for years has been a student of bird songs, as well as an assiduous devotee of music, from which combination of interests she has become equipped with knowledge well calculated to make the most of applications of scientific technique to the study of an artless art (page 352). She is at present making a transcription of the voice of the poet Walter de la Mare. She is the wife of Professor Olin Ingraham of Technology's Department of Economics and Social Science. ❑ Speculative analogies between scientific laws and hypothetical laws in other fields have long been a recreation for ingenious minds—in language, in literature, in sociology, in economics. The technology of trade sketched by WILLIAM A. RHODES, '12 (page 355), thus swells an already large list; it is presented as a provocative essay to which Review readers may be tempted to make additions—or to take exceptions. An engineer with the Bell Telephone Company, Mr. Rhodes, for some years past, has made his avocation consideration of ways to clear trouble in business, carrying on voluminous correspondence with industrial observers, and seeking direct applications of objective method to a new field. ❑ For over 20 years a student of fire fighting not only in the United States but also in England and on the Continent, DONALD HOLBROOK presents in this issue (page 357) an aspect of the fire problem which is, of course, latent in all our preoccupation with fire but which is rarely given explicit statement. Mr. Holbrook's study of fire is another of the unusual avocations in which Review readers are interested. Professionally a trustee and financial counsel, he has written widely on the subject of fire prevention. He is vice-chairman of the fire-prevention committee of the Boston Chamber of Commerce and civilian aide to the chief of his own city, Newton, Mass.

THE Cover Club this month gains a welcome new member, RICHARD W. ST. CLAIR, '36, whose eye discerned and camera fixed in striking perspective the rose window of the Cathedral of St. John the Divine in New York City.

No. 17

Just for Fun! A CHALLENGE TO YOUR INGENUITY

TRY this on your friends. You say, "Write down any number B. Above B, write down another number A, made up of all the digits in B and any additional digit except 0, arranged in any order. Subtract B from A, and tell me the final answer" [C].

Example:
$$\begin{array}{r} 65,835 \text{ A} \\ 5,653 \text{ B} \\ \hline 60,182 \text{ C} \end{array}$$

You can now find the unknown added digit, as follows: add together the digits of C, and if this result contains two or more digits, add these together in turn, and so on, till only one digit remains. This will be the extra digit that was added in forming A. WHY?

[In the example: $6 + 0 + 1 + 8 + 2 = 17$; $1 + 7 = 8$; and 8 was the added digit.]

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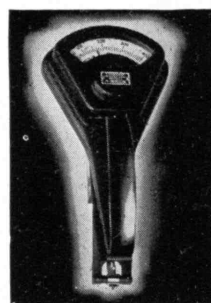
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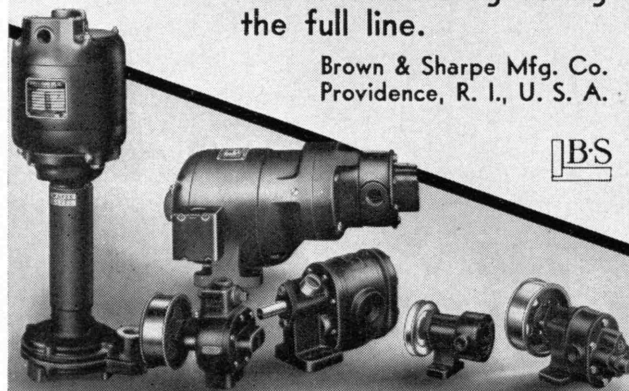
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MAIL RETURNS

Support for Professor Bridgman

FROM HARRISON W. SMITH, '97:

In February, Professor P. W. Bridgman of Harvard announced in *Science* his decision to close his laboratory to citizens of totalitarian states; and in March, Professor Douglas Johnson of Columbia, in the same journal, dissented from Professor Bridgman's position, raising the following questions: "Can we then with propriety open or close our laboratories and our lecture halls for political purposes, even when those purposes to us seem meritorious? Is there not, on the contrary, a fundamental impropriety in mixing politics with science, whether this be done in a totalitarian or a democratic state?" Professor Johnson ends his article with the "plea that scientists fight political battles with political weapons, and that they do all within their power to keep our academic halls and research laboratories sheltered from political storms, safe havens of intellectual sanity, calm judgment and free search for truth in a world gone mad."

From press dispatches at the time, it appeared that Professor Bridgman advanced two reasons for his action: first, to deprive totalitarian states of scientific information which they might misuse and, second, to express his abhorrence of the practices of totalitarian states.

Has not Professor Johnson entirely ignored the first reason for Professor Bridgman's action? Surely a distinction should be drawn between those studies which can only improve the mind and heart of man, and those studies whose products are capable of blowing him to bits. There are many beneficial things to teach a gangster, but highly specialized training in ways of aggression is not one of them.

As regards a great many of the subjects of study and research that are offered in our institutions of learning, Professor Johnson's plea is an admirable expression of the high ideal of service to our fellow men. It would, for example, be commendable if Hitler and his comrades could be induced to come to America in order to pursue, in the environment of academic freedom which exists so abundantly in our country, a few elementary courses in the origin of species and of the races of men, in primitive culture and comparative religion, in ethics and morals. For Fascists great benefit would derive from courses in the history of free institutions from the days of ancient Greece and Rome to the present time. Every effort should be made to attract Japanese students for the purpose of giving them an intensive course in the history, theory, and practice of wit and humor; for it is one of the tragedies of our times that a people whose official utterances so often lead to smiles should be apparently so unable to appreciate the humor they themselves create. Our schools and colleges could do a great deal to improve the intellectual, moral, and spiritual outlook of many totalitarian citizens and subjects; but when we leave consideration of instruction in the humanities and come to various fields of science, the question assumes an entirely different aspect.

A distinguished chemist speaking last summer at the meeting of the American Association for the Advancement of Science held in Ottawa, said that chemistry can, and possibly will, destroy civilization. Indeed chemistry, so efficiently employed by the Japanese, has already well-nigh destroyed the world's oldest existing civilization . . . Yet Technology is now giving instruction in this most dangerous, although at the same time most beneficial, branch of science to students from totalitarian and aggressor nations.

It goes without saying that there is implied no adverse criticism of these young men who are receiving the instruction. They possess, no doubt, many fine traits of character; beyond all doubt many of them are endowed — as Japanese are, for instance — with a quality of patriotism which in our country is all too conspicuous by its absence . . . It is inconceivable that any totalitarian nation — say, Japan — would sell vitally essential war materials to a nation which had machine-gunned and sunk a Japanese gunboat and which had made clear its determined enmity to Japan. Yet that is the kind of thing that industrialists, and notably American industrialists, have been doing. Can anyone doubt that, when Japan is strong enough, her fishermen will resume the extermination of salmon off the coast of Alaska unless the United States is prepared to stop them?

The patriotism of those students at Technology who come from totalitarian and aggressor nations — and no people excel the Japanese in devoted and compelling patriotism — makes it inevitable that they will use to the utmost of their ability the (Concluded on page 382)



L A T E X . . .

The Miracle Worker of Industry

MAY WORK MIRACLES FOR YOU

FEW PERSONS realize how many of the comforts, luxuries, and safeguards of modern living owe their existence to LOTOL (Processed Latex) and its creative development. Yet latex and LOTOL are associated with some of the most outstanding records of progress in the history of American industry. One spectacular achievement after another . . . from yarns to tires, from simple adhesives to artificial leather . . . has rewarded manufacturers who, in LOTOL, found the way to new ideas, new ways of doing things.

Give LOTOL a task for which it is suited and you'll find an invaluable aid. Most of you know that processed latex made possible "Lastex" (The Miracle Yarn that Makes Things Fit) and *Foam Sponge cushions and mattresses*. But few know that LOTOL is being successfully used for sizing carpets and rugs as a non-skid surface and to reinforce constructions, lining barrels, impregnating papers and textiles . . . in cements and adhe-

sives, in shoes, artificial leathers, self adhering gauze, gloves, footwear, toys and novelties, book binding, insulated wires, battery plates, upholstery fabrics, flooring, expansion and contraction seams for concrete structures, in chewing gum bases, leather finishes, temporary protective coatings, golf balls, curled hair cushions, bathing suits and caps, tree surgery, and rubber sundries.

The surface hasn't been scratched yet. Industry hasn't explored the possibilities of latex and LOTOL . . . and we don't know them all ourselves. But surely it is evident that latex products are becoming more and more essential to modern living. This is a restless, impatient, ever-changing world, forever clamoring for the things which will make it better. And no one knows it better than the American manufacturer, who would do well to look ahead to the possibilities of using LOTOL to improve processes and products. Naugatuck Chemical engineers will be very happy to cooperate.

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Naugatuck



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ALUMNI DAY — JUNE 5

THE PROGRAM



June 2-4 and later

CLASS REUNIONS . . . from '89 to '34 and all the five-year classes between . . . and a few extras . . . from Connecticut to Marblehead the hills and dales will echo to the sounds of merrymaking.

June 4

DR. COMPTON'S SUPPER . . . (for Honorary Secretaries, Officers of Alumni Clubs) 6:30 P.M., Engineers Club, 2 Commonwealth Avenue, Boston . . . informal dress.

COURSE XV REUNION . . . a Convocation of Course XV Graduates on the occasion of the Department's 25th anniversary . . . to discuss the future of its service to students. Starting with commemorative services at Christ Church, Cambridge, at 11:00 A.M., through lunch at the Hotel Continental, group conferences in the afternoon, the Convocation Dinner in the evening at Walker, and ending with a breakfast at Walker on Monday.

June 5

ALUMNI DAY . . . Starting at 8:30 to 10:00 A.M., with **REGISTRATION** in the new Rogers Building lobby. . . Here Course XV Convocationers and Refugees from Reunions will mingle with just ordinary alumni, their wives and families. Those arriving early will have an opportunity to look over the **EXHIBITS** which will be on display throughout the day. . . Army, Navy, and Air Forces have all contributed to this visual demonstration of the major part that engineering and science plays in today's National Defense program. And then at

10:00 A.M., real start of the day's varied activities, the important **CONFERENCE** on "The Technology of National Defense." No more timely subject could have been chosen . . . no more authoritative panel could have been secured than

DR. GERARD SWOPE, '95, *Presiding Officer*
President, General Electric Company

HONORABLE CHARLES EDISON, '13
The Assistant Secretary of the Navy
"The Navy and Industry"

HONORABLE LOUIS A. JOHNSON
The Assistant Secretary of War
"Some Fundamentals of National Defense"



At the close of the Conference at

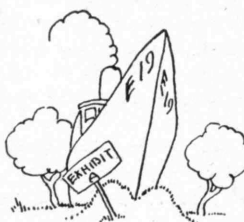
1:00 P.M., come the **LUNCHEON** in Du Pont Court for all alumni and their guests . . . if the meteorologists are noncoöperative the location will be changed to the fourth floor of the new Rogers Building — the exhibition and drafting rooms . . . an excellent opportunity to inspect this new building, by the way. Luncheon over, at

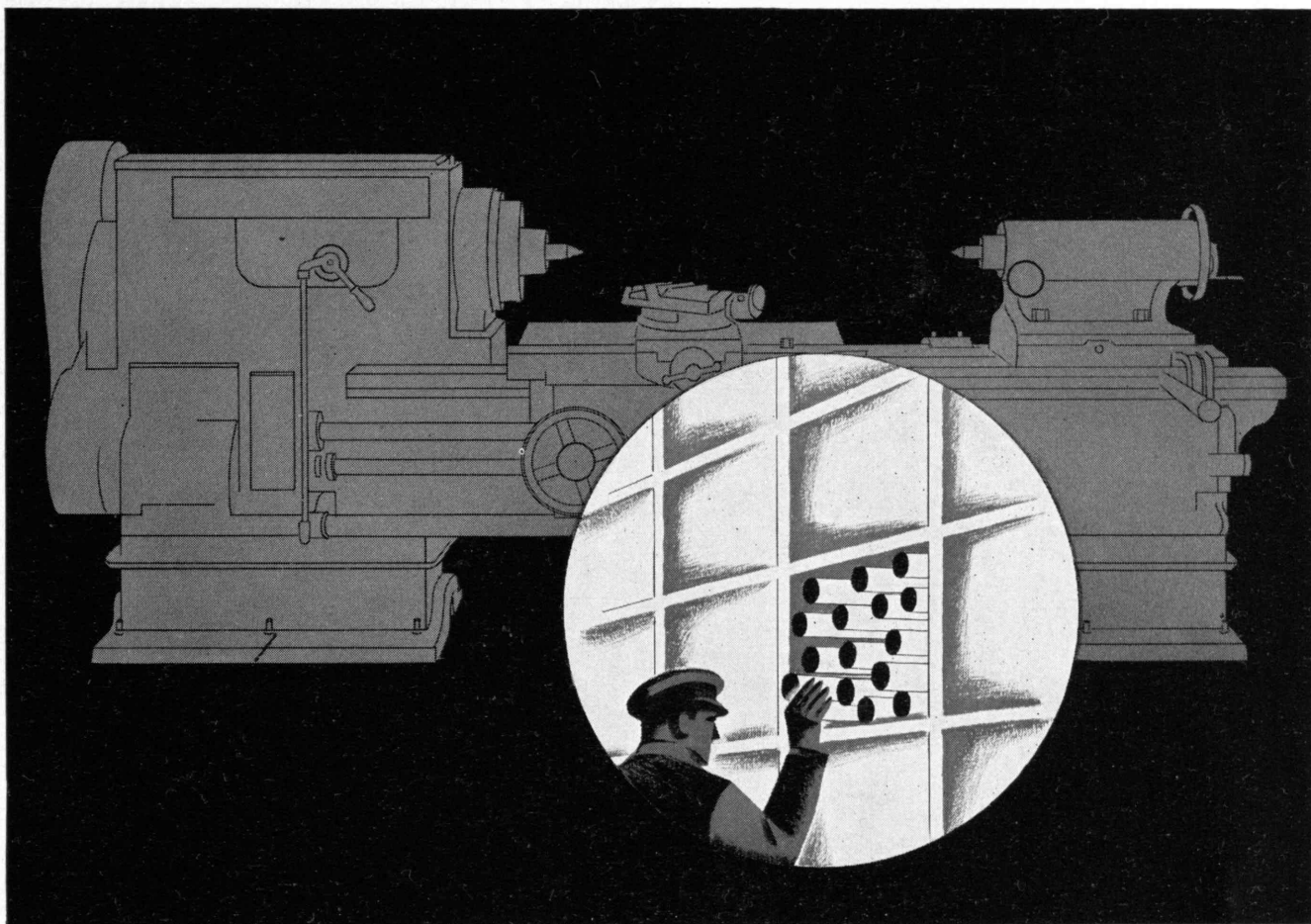
2:00 P.M., come the **CLASS DAY EXERCISES** in Lowell Court . . . a joint program of the Senior Class, the Class of '89, and the Class of '14. Speakers include President Karl T. Compton; H. B. Richmond, '14, President of the Alumni Association; Franklin W. Hobbs, '89, for the 50-year class; Charles P. Fiske, '14, for the 25-year class. Immediately after the exercises at

4:15 P.M., the **DEDICATION OF THE BRIGGS FIELD HOUSE** will be held . . . erected from the funds contributed by alumni for this purpose . . . a chance to see what's been done with them. . . . And then at

4:45 P.M., tea will be served at the official **OPENING OF THE DARD HUNTER PAPER MUSEUM** . . . a new acquisition including the most complete collection of handmade papers in the world . . . third floor, Building 7. With the Dedication, formality comes to an end . . . from this time on fun and gaiety reign supreme . . . "this time" means officially

6:30 P.M., the start of the **ALUMNI DINNER** and "on" means just that — on! The place is again the Hotel Statler in Boston. Continuing the custom begun last year the Stein-on-the-Table will again be an important feature . . . another distinctive souvenir of a very large evening. Only scheduled talk of the evening is President Compton's. Main event of the entertainment will be the epic news sequence "Technology Prepares for Defense." What startling steps are being taken? What makes Charlie Locke such an important factor? Have you heard the "Faculty March," a spine-tingling bit of martial mélange? These are but vague indications of what this Masterpiece of the Magic Lantern holds in store. Musical interludes will include the performance of the Hammond Novacord . . . an instrument that does almost everything but cook . . . various vocal and instrumental offerings.





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That is why Goodyear dares make this bold statement: no matter *what any other truck or bus tire has done for you, the YKL will do it better!* The reason is that the YKL's Rayotwist carcass is far superior to ordinary constructions in strength and in its prolonged resistance to heat — the cause of 82% of all truck tire failures. America's truck and bus operators stand to save millions of dollars a year with this astonishing tire. By such services to its fellow men in many fields does Goodyear justify the greatest name in rubber.



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GOODYEAR



Summer Business
— a bee at work

Myron Stephens

THE TECHNOLOGY REVIEW

Title Reg. U. S. Pat. Office

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

VOL. 41, NO. 8

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From a photograph by Richard W. St. Clair, '36

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THE TECHNOLOGY REVIEW

Vol. 41, No. 8



June, 1939

The Trend of Affairs

The Way Is Open

MANY a discovery in chemistry has been "of purely scientific interest." Such discoveries have improved our understanding of nature and widened our vision but have suggested no immediate applications or benefits. Other discoveries, such as the electrolytic process for producing aluminum from bauxite or the cracking of petroleum, are of obvious usefulness. It has remained only to apply them and to develop their implications. Still others, remote in some far corner of science, seem at casual glance to be of interest only to the experts in the special fields. They appear to relate to little that is of interest to the general public or, for that matter, to the majority of chemists. Yet they are links, perhaps the last links that remained to be forged, which constitute, with the pieces of knowledge already confirmed and stored away, the final chain connecting available substances to new uses. They thus provide a connection between abundant raw materials and products long known and used which have not heretofore been procurable from them. They are often the proximate and effective causes of profound changes in the economy of their times.

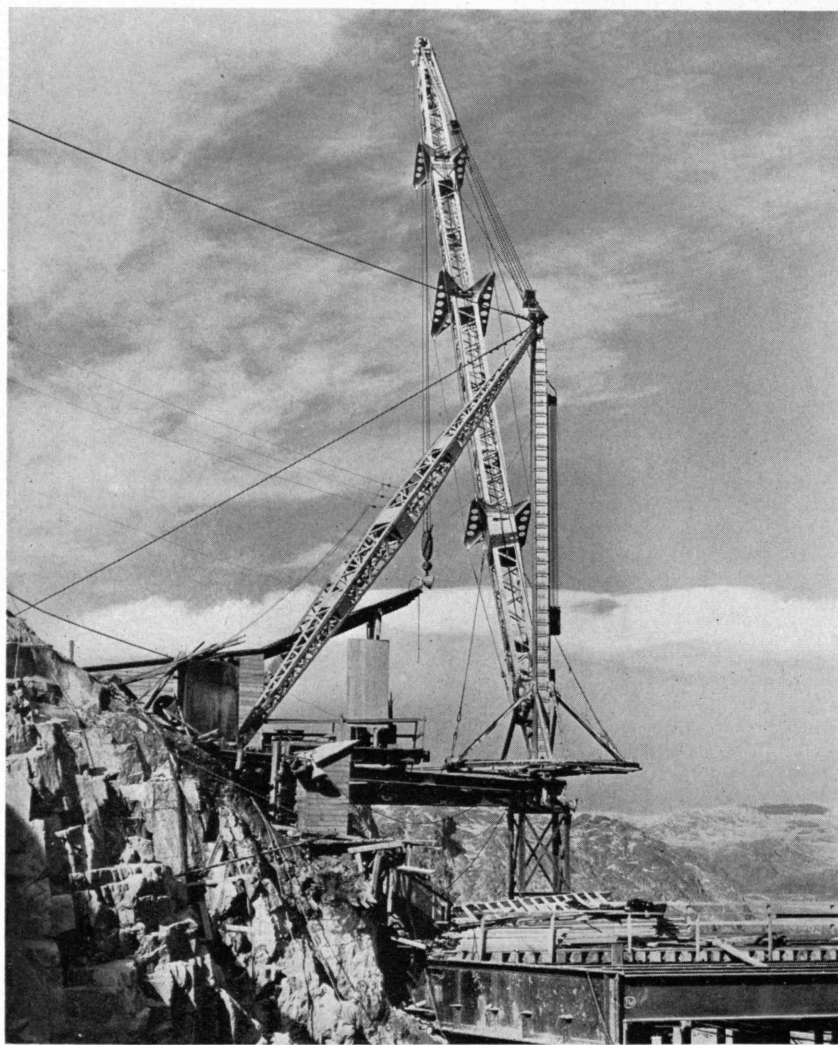
At the spring meeting of the American Chemical Society in Baltimore, three papers were presented to the division of organic chemistry which described discoveries of much significance for our industry and our national defense. They are of great value and effect because, in combination with the advances already won, they open new ways of general advance.

From Raymond B. Collard, '20, comes this frontispiece — a photograph whose strength matches that of its subject, a figure from the Fountain of Western Waters in the Court of Pacifica at the Golden Gate International Exposition

The gaseous hydrocarbons — methane, ethane, propane, butane — which occur in the natural gas of petroleum wells are, of course, good fuel, but they are worthy of more important uses. These paraffin gases are inert chemically. They have not submitted to the systematic and methodical attack of reagents such as chlorine by which chemists have hoped to convert them into more reactive and, ultimately, more useful substances. When they have reacted at all, they have shown a disposition to react violently — to go all to pieces — and have failed to yield tractable derivatives.

Professor Henry B. Hass of Purdue University now reports that, with H. J. Hibshman and E. H. Pierson, he has successfully attacked them with the hot vapor of nitric acid and has procured nitromethane, nitroethane, nitropropane, and other nitro compounds, in excellent yields by a process which is feasible on a commercial scale. Indeed, we understand that factory production is now being commenced. The nitro compounds, by processes already well understood, may be converted into amines, nitro- and aminoalcohol, glycols, and triols which will be useful for the preparation of dyestuffs and synthetic medicinals and for other processes.

Among the products procurable from nitromethane by the action of formaldehyde is one whose molecule differs from the molecule of glycerin in having a nitro group in place of one of glycerin's hydroxyl groups. And there is another which differs from glycerin in having additionally one carbon atom, one hydrogen atom, and one nitro group. These two substances, on nitration, yield materials which have the desirable properties of nitroglycerin and perhaps lack some of its undesirable ones. They may be used in the manufacture of dynamite and of "double-base" powder. In short, the vapor phase nitration of the gaseous paraffin hydrocarbons opens the way for the production of explosives from natural gas and will leave our supply of glycerin,



U. S. Bureau of Reclamation

At Grand Coulee — this derrick with its 140-foot boom against the sky

heretofore used largely for making explosives, more readily available for the thousand other uses for which it is fit in the arts and industries.

Natural petroleum contains a relatively small amount of material which distills within the boiling-point range of gasoline. The supply of this important material is increased by cracking the long, heavy molecules which make up the less volatile portions of the oil. When these are heated sharply, they yield smaller molecules of the nature of gasoline, along with a quantity of unsaturated hydrocarbon cracking gas. The gasoline from cracking, however, contains very little of the antiknock octane which is so much desired, say, as part of the equipment of aerial warfare. The cracking gases, being unsaturated, are reactive chemically and are at present being converted into alcohols, glycols, esters, solvents, and plastics. Two other discoveries of great interest, announced at Baltimore by chemists of the Shell Development Company, are links in the chemical chains which lead, respectively, to the production from cracking gas of an important material which has heretofore been procured only from plants and animals — that is, from potential foods — and to the production of high-octane gasoline from plant products which,

since we have sunshine and water and synthetic fertilizers, may, of course, be produced as needed in any quantity which may be desired.

Cracking gases contain propylene. At ordinary temperatures chlorine and other reagents attack the unsaturated part of the propylene molecule to produce compounds which will undergo further chemical changes, and the possibilities here suggested are already being exploited commercially. Herbert P. A. Groll, G. Hearne, and Evan C. Williams have discovered that chlorine at high temperatures does not affect the unsaturated part of the propylene molecule but attacks the saturated part — to form allyl chloride. Allyl chloride, by familiar and easy chemical processes, may be converted into glycerin. We are now no longer obliged to procure our glycerin from fat. It is no extravagant fantasy that we may, if we wish, be able to produce our fats, and hence a part of our food, from cracking gas from petroleum.

Acetone, an extremely valuable solvent familiar to everyone as a paint remover, is now produced in thousands of tons annually by the fermentation of corn. The supply of corn in the United States is, we believe, determined and limited solely by the demand for it and by the will to produce it on the part of the farmers. Acetone undergoes readily a condensation reaction by which it is converted into diacetone alcohol, also a useful solvent and a starting point for synthesis. S. H. McAllister, William A. Bailey, Jr., and C. M. Bouton have discovered that diacetone alcohol when heated is largely converted into isobutylene, a substance which occurs in cracking gas only in very small amounts. Now isobutylene may be polymerized to mixed octylenes, and these by simple hydrogenation yield mixed octanes, principally 2,2,4-trimethylpentane of an octane number of 98. The way is open from corn to a superlatively good antiknock fuel for internal-combustion engines.

Resurrection Pianissimo

WHEN the *Mauretania* ended its career on the scrap pile in the spring of 1935, the North Atlantic service was without that illustrious name for the first time in 29 years, during 22 of which the vessel had held the Atlantic Blue Riband. Now a new *Mauretania* is afloat, and on June 17 she is scheduled to sail from Liverpool for New York.

The old *Mauretania* was the queen of transatlantic liners. By a curious and threatening parallel, she was built about 1907 to retrieve for England the speed mastery of the North Atlantic that had been lost to an

aggressively expanding German fleet. With her sister ship, the *Lusitania*, she was at that time the largest and by far the most powerfully engined merchant vessel afloat. From Theodore Roosevelt's time to Herbert Hoover's — or longer than any other steamship in history — the *Mauretania* ruled the world's most heavily traveled ocean tracks, then lost her position to the German *Bremen* in 1929. Today another record-breaking pair, companions rather than twins, maintain British dominance of the express service between Europe and America: the *Queen Mary* and the not yet completed *Queen Elizabeth*.

The new *Mauretania* does not represent a full-blown resurrection. Her 42,000 horsepower are expected to drive her at about 22 knots, hardly comparable with the speed of present express liners or even that of the old *Mauretania*, which, with Scotch boilers and low-pressure steam, once made 30 consecutive crossings in one year at an average speed of 25.5 knots. In a way, the building of this ship with such a modest future is an admission that her owners, like other steamship operators, have for a number of years seen clearly the handwriting on the wall. When plans for the first *Mauretania* were considered — and they were ambitious enough to cause much headshaking — the only possible challenger to a crack liner was a larger and faster ship. A threat from the air was more remote even than one from a tunnel under the Atlantic.

Regular transatlantic plane service, however, is now a probability of the near future. Liners will not long be able, therefore, to maintain their supremacy in the greatest of all attractions to the ocean traveler — speed — but will be reduced to offering less aristocratic

temptations such as comfort, safety, tasty food, and amusements. Some informed opinion holds that air competition may emphasize a trend toward more or less standard passenger and cargo vessels like the *Manhattan*, *Washington*, and *America* (the last still abuilding) of the United States Lines, the *Nieuw Amsterdam* of the Holland America Line, and the Cunard White Star's new *Mauretania*.

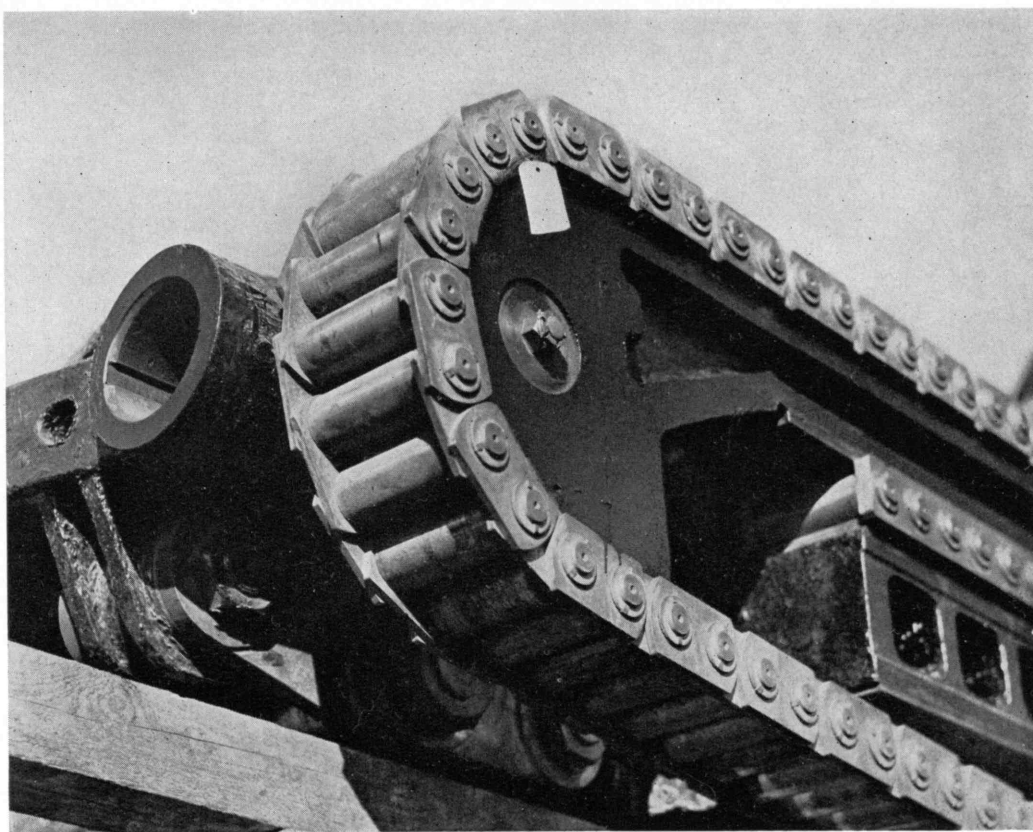
For the benefit of sea-minded dilettantes, a few statistics regarding the last-mentioned ship follow: The keel of the *Mauretania* was laid on May 24, 1937; the ship was launched last July 28; and as plans now stand, she will sail for the United States about the middle of this month. She is 772 feet over all, 89 feet six inches in extreme breadth, and 111 feet two inches from keel to top of superstructure; has a maximum mean draught of 30 feet nine inches; and a rating of about 34,000 tons gross. Passengers will have three classes of accommodation — cabin, tourist, and third; there will be a sizable space for general and refrigerated cargoes (390,000 and 75,000 cubic feet, respectively); and garage space for about 70 cars. As with many large ships, certain public rooms will be air conditioned, and a dust-extracting plant is being installed to clean the flue gases from the boilers.

Electrons in Regiments

IN the subatomic world where electrons dwell, new dictatorships are arising — more impersonal than Hitler's, perhaps, but equally implacable. The regimentation has sprung up in several parts of the electronic domain because of the efforts of three groups of scientists

Armament of peace — not a new type of tank but part of the leaf assembly of one of the 102-inch Paradox gates, installed in tandem with "ring-follower" gates for controlling each of 20 outlet tubes in spillway of Grand Coulee Dam. The completed dam will have 60 such outlets, each with a pair of such gates, and having a capacity of 273,000 second-feet discharge — in addition to one million second-feet over the spillway.

The part shown weighs 53,300 pounds; the assembled gate, 186,872 pounds. Gate dimensions: 42 feet long, 11 feet eight inches wide, and five feet thick



U. S. Bureau of Reclamation

working independently for a common goal: the harnessing of a new region of the radio spectrum. In these columns in February (page 156) was made the first public announcement of the klystron which was developed in the physics laboratories of Stanford University. Within a week the February issue of our contemporary, *Electronics*, appeared with the announcement of another device, known succinctly as an "ultrahigh-frequency power amplifier of novel design," constructed at the RCA Radiotron laboratories. Then a day or so later came forth the *Proceedings* of the Institute of Radio Engineers with "velocity-modulated tubes" from the General Electric laboratories. These devices, differing in details, are all very much the same in that they use beams of rapidly moving electrons which are regimented into groups and which are, in a loose manner of speaking, made to do the goose step.

To understand the utility of the new regimental tubes; we remind ourselves that the radiation spectrum contains, among others, two classes of vibration of great interest to mankind: radio waves and heat waves. The radio waves extend in length from thousands of meters to a fraction of a meter, whereas the heat rays are measured in millionths of a meter. In opening the region between the two, the most promising line of attack

Lightning-flash photography without benefit of stroboscope; at left center a stone flung as ballast for a submerged wharf crib on Digby Gut, Nova Scotia, has punched in the water a hole which the camera caught before it could close

C. H. R. Mabie



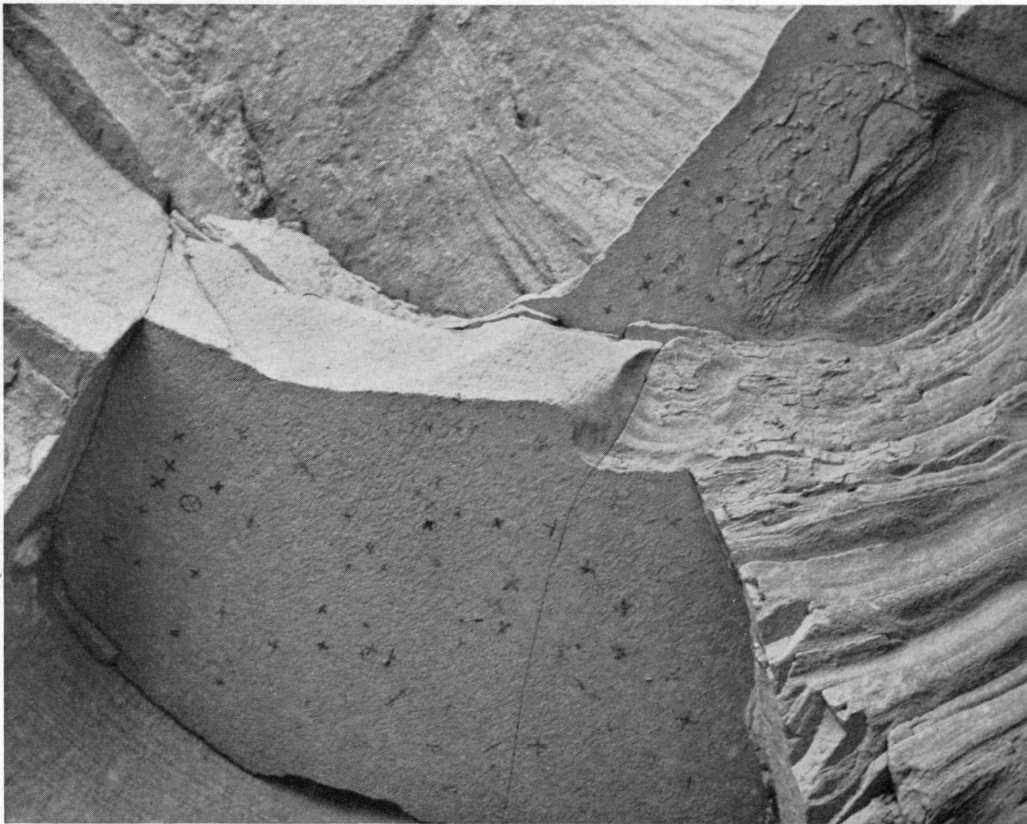
seems to be the production of shorter and shorter radio wavelengths. Radio waves as short as two millimeters have been generated; the harmonics of these waves have been detected in the infrared region; and so the gap between infrared and radio can be said to be closed. But this is a matter of laboratory experimentation only, and of a most tenuous sort at that. For practical purposes the search for new radio-wave generators has been confined to the region between one centimeter and one meter. Such waves have been known since Hertz's day, but their practical application has been limited by the inefficiency and instability of the generating sources, as well as by the fact that they were damped, were interrupted, instead of continuous, form.

The virtue of these very short waves for communication can be judged from a simple example: Wavelengths used in broadcasting range from 185 meters to 550 meters. In this range there is room for roughly 100 broadcast stations, all operating simultaneously and each preempting a slice of the spectrum ten kilocycles wide. These same 100 stations could operate simultaneously in the region from 10 centimeters to 9.9966 centimeters. Or, to put it differently, in the range from 10 centimeters to 100 centimeters there is room for no fewer than 270,000 broadcast stations, all operating simultaneously. There are those who say that 100 stations are quite enough for them, thank you. But when the demands of all the other radio services are considered, including the wide stretches of space required by television stations, the potentialities of the ultrashort region assume important proportions. So all eyes are trained on any development which promises to make this region more readily available.

Possibly of greater importance are the applications which may be foreseen for these waves in producing narrow beams for use in navigational aids and secret and directed communication, as well as for use in the transmission of vast blocks of intelligence through hollow-tube wave guides. The regimental tubes are precisely the needed developments.

A notable simplicity is to be observed in the principle and the mechanism of these tubes. Their operation results essentially in the conversion of a directly and uniformly moving stream of electrons, which we may liken to an unruffled river, into a series of dense groups of electrons spaced out by thinner, or more rarefied, groups — a situation which we may liken to the surface of our river after it has been acted upon by a wind which has set up waves. Energy or velocity can be given to electrons by passage through the electric field of an ordinary battery, a familiar example of which is to be seen in the cathode-ray oscillograph. In the new tube we start with a stream of electrons which have been thus energized, and we undertake to convert the energy of that direct velocity to the useful energy of an alternating current. With low frequencies this conversion is done by the ordinary audion, the tube familiar to all owners of radio sets. But the audion is not fast enough in operation to make the desired conversion in the extremely short intervals of time allowed by ultrahigh frequencies.

Here is where the new device finds its opportunity. In the new tube an electromagnetic field is set up which in its oscillations is a facsimile of a given signal



Robert D. Harvey, '38

For star watchers — the "planetarium" in the Canyon de Chelly National Monument, Arizona. Crosses on the domed roof of this cavern are thought to represent stars. They were placed there centuries ago, when the cave was occupied by a cliff dwelling which, abandoned probably in the latter part of the 13th Century, has long since collapsed. The roof paintings were brought to notice by Dr. and Mrs. Leland C. Wyman of Boston University's School of Medicine

frequency; through this magnetic field we direct the stream of electrons possessed of simple direct energy. Since the fluctuations of the field give to some electrons a forward pull and to others a backward push, the stream, as it emerges from the field, consists of electrons whose velocities are molded in accordance with the fluctuations determined by the signal frequency. As the procession moves forward, some of the slowed-down electrons are overtaken by the speeded-up electrons, so that within a given distance what had been a steady flow becomes a modulated flow, or a periodic series of groups. So much for the first faculty of the new tube.

Having broken up the direct-velocity stream into an alternating stream, the tube next undertakes to secure a useful result from the new configuration. If the electron groups are next sent through a chamber whose electrical resonance is responsive to their frequency, an electromagnetic field will be set up in the chamber, varying so as to absorb the energy of the grouped electrons. But remember that the grouping of the electrons in the first place corresponds to a signal frequency. Since the new electromagnetic field is reponsive resonantly to this frequency, it is an enlarged edition or an intensification of the original signal. The device at this stage is operating as an amplifier. Now if we connect the resonance chamber to the original electromagnetic field so that the intensified oscillation reinforces the signal frequency that did the bunching or grouping in the first place and so serves to concentrate still more electrons, the device becomes an oscillator.

Tubes based on this principle have generated hundreds of watts of power on wavelengths as short as 10 centimeters, where watts and fractions of a watt only

could be generated before. And the principle seems capable of extension to much higher powers — thousands of watts possibly — if high currents and voltages are employed in forming and grouping the electron beam. More amazing, the tubes are not restricted to the mere generation of power. They can perform all the functions of conventional radio tubes (amplification, oscillation, detection, frequency conversion) and hence can be used for reception, as well as transmission, of ultrashort wavelengths.

Scientific Outdoor Music

MAN has always associated music with the outdoors. Nature seems to offer for it a more perfect setting, more sympathetic surroundings, than do halls and auditoriums. But problems of acoustics and of weather have, in the past, combined to drive it chiefly indoors. Science is, however, contributing increasingly to the possibility of outdoor music by rapidly overcoming these two stumbling blocks. As the art of music has developed, so have the demands of the audience which now perceives and appreciates the fine nuances of music and wants them outdoors as well as in. The result is music shells which are being erected outdoors in all parts of the country.

The problem of building them is one primarily for the scientist. From the latter's standpoint musicians are rather a hindrance than a help. For instance, if the music sounds at its best to the conductor on the podium, it will do so at the expense of better receptivity in the audience, since the reflectors will be adjusted so as to throw the maximum amount of sound on the podium

rather than beyond it. Furthermore, the building of shells is little more than the proper application of a scientific formula, acoustically speaking, and good reproduction is merely a matter of compounding, in the right proportions, the various elements to be considered.

At first glance the problem of an outdoor theater with a roof, completely open sides, and a rear wall, such as that completed last year at Stockbridge, Mass., for the Berkshire Symphonic Festival, might appear to belie the foregoing statement; but the problem is simply one of handling properly the echo from the rear wall and reverberation from the floor and the seats. The people in the audience were found to absorb satisfactorily the reverberation from floor and seats, and a baffle placed at a proper angle took care of the echo. The sound that escaped through the open sides simply escaped; there was nothing to be done about it.

Shells themselves do not differ greatly in shape, and the varying materials now in use all give satisfactory results. The shells at Grant Park in Chicago, at Humboldt Park in Minneapolis, and at Municipal Park in Hartford are of wood. Those at Sioux City and Manchester, Iowa, are of concrete. The Hollywood Bowl is constructed of steel. All sizes, as well, produce good music, from the widest studied — the Hollywood Bowl, 90 feet — to the narrowest — Manchester, 38 feet — though quite naturally the size has a direct effect on the number of musicians who can be accommodated. The Humboldt Park shell has room for 100 musicians and 300 choristers.

M.I.T. has been a contributor to the development of the modern music shell through past and present faculty members: William R. Barss, instructor and later assistant professor of physics from 1912 to 1931, assisted in the construction of the shells on the Esplanade, Boston, at Municipal Park, Hartford, and at Radio City in New York; Professor Richard D. Fay, '17, of the Department of Electrical Engineering solved the acoustical problems of the outdoor auditorium for the Berkshire Symphonic Festival already mentioned. Tests which he used there were conceived by his colleague, Professor Wilmer L. Barrow, '29.

Some shells are built in bowl form, the seats constructed in the shape of an amphitheater on a rising slope, and in others the audience is on level ground. The only difference in the construction of the shell itself is that, for a tiered amphitheater, the reflecting surfaces must be raised sufficiently to throw the sound upward at the proper angle rather than straight out horizontally. The most notable bowl is that at Hollywood, but others are located at Sioux City, Iowa, Fort Scott, Kansas, and Berkeley, Calif. Hollywood has the largest seating capacity in this class: 22,500. It is outdistanced only by Minneapolis, which claims a seating capacity of 30,000. However, it is doubtful if the flat area covered by the audience at Minneapolis could equal the acoustical tests undertaken at Hollywood, where a No. 10 bird shot, dropped from a height of only half an inch, could be heard distinctly throughout three-quarters of the bowl area. Because the total construction is much less expensive, the flat audience space is usually more desirable; shells of this type in Sidney, Maine, Quincy, Mass., Central Park, New York City, New Rochelle, N. Y.,

Buckhead, Ga., Toledo, Ohio, Pasadena and San Francisco, Calif., and Dallas, Texas, show that all parts of the country are represented in this increasing expression of musical interest.

The ingenuity of the scientist is not expended, however, with the completed shell. Amplification systems add the final touch to outdoor music. The most elaborate is that at the Hollywood Bowl, where three loudspeakers are installed above the shell, each connected to two microphones — six in all. The two at the left of the stage are placed so as to accentuate low notes. The remaining two pairs are divided in function, one in each being for the orchestra, the other for soloists. This arrangement allows for a wide range of possibilities and provides for every musical situation which is likely to be confronted.

Another interesting feature of the Hollywood Bowl is that the whole shell can be removed should the stage be used for other kinds of performance. It is constructed on a movable floor which is set on rails, and the whole thing can be pulled to one side. Other shells are sometimes built thus so as to permit disassembling and erection elsewhere. The one at Grant Park, Chicago, is composed of six separately built, arched, laminated wood trusses, the largest consisting of 180 pieces glued together.

If we disregard a few sporadic early attempts, dates of construction indicate that the application of science to outdoor music in the form of the shell is recent and that progress is still to be made. The first important construction was at Hollywood in 1930. All of the other shells here mentioned were built subsequently, and more are probably under erection at present. Significant it is that the growth of outdoor music festivals coincides with the development of adequate facilities. Except for the Bach Festival, begun in 1900 at Bethlehem, Pa., the larger ones were inaugurated recently, beginning with the Chicago Music Festival at Soldiers Field in 1929.

Since then, others have sprung up: the American Folk Song Festival at Ashland, Ky., and the White Top Folk Festival at Marion, Va., in 1931; the Music Festival at Little Boar's Head, N. H., in 1933; the Berkshire Symphonic Festival at Stockbridge, Mass., and the White Mountain Music Festival at Whitefield, N. H., in 1934; the Silvermine Guild of Artists Music Festival at Norwalk, Conn., in 1937. All of these indicate that the public is rapidly taking advantage of outdoor facilities, although as yet some festivals do not possess shells.

Science coupled to man's natural inclination is responsible for making all this possible, and further advances are undoubtedly still to be made. In not a few ways, the United States of the 1930's are witnessing in this development an apotheosis of the United States of pre-World War times. The outdoor bandstand and the Sunday concert in the park are experiences familiar to thousands. People have come to desire to take more than brass instruments outdoors with them. From this desire evolves the shell that replaces the bandstand designed for a circumferential audience, and the summer symphony orchestra that is displacing the Silver Cornets of the past.

Philosophy and Modern Architecture

The Profession Which Links God and Men Must Make Its Works Express the Age — Here is Source of Present Puzzles

BY ANTONIN RAYMOND

THE true principles of Modern architecture can be comprehended only insofar as we realize that the architect is not, and never has been, free to disregard the technical and engineering sciences and the material requirements of daily life. The modern architect does not just build houses; he must face and solve the problem of living itself. And thus the principles which should guide him are eternal principles. That is why a light from the distant past so often illumines the present. To appraise what an architect should follow, it is useful, therefore, to turn to a Hindu philosopher who lived fifteen hundred years ago and who proposed a list of all the things that an architect should know.

The order in which these things are listed is not devoid of humor: An architect, the recital holds, should be acquainted with the laws that govern the universe and with the laws that govern nature; he should be a master of dancing; he should have a profound knowledge of the Vedas, of painting, sculpture, ethics, of engineering, botany, astrology; and he should be able to organize rites and ceremonies and to play all the musical instruments.

Another Hindu sage begins a treatise as follows: "I shall now describe the qualifications of architects and the system of measurements in order. From the supreme Siva emanate the Creator Brahma and also Indra. That he is the Great Architect is proclaimed by God himself. It is He who, as the Architect of the Universe, creates the world. From his four faces, four families of architects are born. The son of him bearing the name of Viswakarma, is called Sthapahti, the Master-BUILDER. He is the teacher; he teaches and directs the other three families — two of which are designers and the rest carpenters."

However humbly architects may think of themselves, these philosophers set them up very high. In their opinion, architects are

immediately responsible to God for a great many things. In fact, they are the direct descendants of the gods themselves. They may prefer to serve, humbly trotting along between shafts and blinders like the old farm horse, but wings are thrust upon them and they are shot up among the clouds.

And it is good that they should be. Whether men today look at the stars through gigantic telescopes, study life through microscopes, or split atoms, they are likely to take a shortsighted view of nature. The grandeur of the universe is visible to all, without instruments, if we really look, and we can all see certain of her laws at work. In particular, I mean the laws that govern life. Our ignorance of them and of their importance in our lives is the cause of the world chaos today.

It may seem as if I were encouraging the architect to invade the field of the philosopher, but I feel we are all of us too near catastrophe to continue working with our noses on our drawing boards in obliviousness of the drama which concerns us immediately.

By choice, architects have taken a profession that makes of them a link between God and men. Their work is an art, and its purpose is to translate divine truth, beauty, order, into matter for the instruction of mankind. Such high-flung phrases may seem ridiculous when we architects remember the kitchens and the bathrooms for which we must soon answer. But that is exactly where we can build, create, beautify. Cathedrals and market places equally offer us our opportunity. Therefore, the task we must set ourselves is to draw our erring humanity back into a harmonious relation with the universe, for this is the only way to true progress. Otherwise we face retrogression.

This task may seem a stupendous one for the architect, who may here and there fall short of the ideal set up by the philosopher. The physician, however, before receiving his degree is asked to assert his belief in a simple



Gtraudon — Boston Museum of Fine Arts
(349)

ethical creed. How natural it should be, then, for the one whose profession is bound up with a love for beauty and order, to go forth into the world conscious of large responsibilities, receiving from Heaven and transmitting to men truths of lasting value in forms which can be comprehended.

There is in each cycle of civilization a period at which a peak is reached—a peak in which are found condensed and materialized the specific ideals for which that cycle stood. Such were the highest periods of Egypt, of Greece, of Rome, and, in our own cycle (beginning with the decadence of Rome, and ending, I propose, now), such was the Middle Age. The fact that to this day visitors swarm from all parts of the world to view the cathedrals of Europe, is a testimony to the mysterious spell these cathedrals cast on men. Why this spell? Because in the 12th, 13th, 14th centuries, the ideals of Christendom which the people had grown to cherish during the preceding centuries were finally fully embodied in stone because they were at last fully grasped by the whole of the people.

Following this there were decadence and decline; neither the Renaissance nor, later on, the architecture of the 18th Century, though each is magnificent in its way, has the Gothic power or purity. The common spiritual quest is replaced by an individual one, and the goal becomes confused. Finally, in the 19th Century, all common vision is completely lost and is replaced by personal fancy, perfectly expressed by the monstrosities of that period. Notice that whereas, as I have already mentioned, great periods are always the expression of a cosmic idea—Greece had Truth and Beauty,

Buddhism had Liberation—civilization at its lowest ebb is possessed by the importance of the personality. There have been times when the only thing that mattered about a thing was that it be true, not what anyone might think about it. Plato argued that opinion is the opposite of wisdom. Personal fancy may be regarded as the source of error, as well today as in former ages.

And what has become of the architect through these six centuries? He who in Gothic times was versed in the profound esoteric meaning of symbolism, who was versed in engineering, painting, music, rites, and ethics (as described by the sage), has, in the 19th Century, become a decorator. Unable to design new forms, since forms are the expression of ideas and of ideas he has none in particular, he recapitulates as well as he can the forms of past ages. His former powers are lost. His engineering, since he can no longer calculate, he has passed on to a servant appointed by himself. And having lost direct contact with materials because, since he employs a contractor, he has forgotten what wood and stone and steel are, he has lost the power to build. He is now a harmonizer of exteriors as distantly related to the master builder as the crooner is to Beethoven. Meanwhile the engineers and mechanics and contractors have run away with the job of building, and one can still see going on that novel phenomenon, which to our Hindu philosopher would have appeared so strange—engineering and architecture divorced. That is to say, functionalists oblivious of esthetics, esthetes oblivious of function.

It was to remedy this state of things that Modern architecture was born. There was nothing great in its beginnings. It represented a process of cleaning up, an



In these three photographs The Review presents representative excerpts from Mr. Raymond's practice of the theory expounded in his essay. This bedroom in a concrete house by the sea shows the use of sliding steel windows and natural materials

attempt to cure the architectural indigestion of the 19th Century. It resembled a dose of castor oil. Its initiators had no desire to formulate a new order, i.e., to determine and fix new forms. They wished to rediscover lost principles.

The new architects were unconcerned with form. Their desire was to discard the old stuff and begin anew. The first impulse resulted in the scraping off of ornament, revealing structure, allowing the building to stand in its crude nakedness. Then it became evident how much ill-conceived construction had been concealed under decoration. The next step was to bring into the functioning and structural qualities of the building real order, as it is to be found in modern machinery and in living bodies; for, it was realized, there is beauty in the machine and the body when they function perfectly. In addition, the functioning was to be clearly expressed in and out. The new buildings were to express the life and movement taking place within. They had so long been static and monumental (visualize any typical college or state building, or station or bank building) because the static and the monumental were the 19th Century method of affirming the grandeur and power for which that century strove. Modern architecture accomplished this expression of movement by unbalancing equilibriums, by varying heights and spaces, a method well known in Japanese architecture where houses wander gracefully through the garden. For a time, unbalance as a principle was enjoyed for itself. It is natural for excesses in one direction to be followed by excesses in the other. Thus we find Gothic asceticism (see Gothic sculpture) followed by a period of delight in sensual pursuits (see the pagan scenes of the *quattrocento* painting). Further it was realized that air and light could be had for the asking because of modern engineering which permitted the spanning of wide spaces, the adoption of light construction, the use of

steel and concrete, the inclusion of large panes of glass.

Then the architect again took to town planning — an art he had set aside — for he recognized at last that his responsibilities exceeded the scope afforded by the consideration of the needs of the individual, and that he had a duty toward society. As the Gothic architect, not figuratively but actually

(study the history of the Chartres Cathedral and the manner in which it was built) by means of the cathedral brought the people in contact with the living Christ, so the architect today feels a desire to bring the people in contact with living beauty, air, space, growing things (study some of the plans of cities drawn up by Modern architects).

Those who did understand what the new movement stood for are still working from the developing original scheme toward purging architecture of nonessentials, making room for the free expression of the life of the day, seeking by every possible means to live better and to find better ways of living; in fact, trying to determine what makes life worth living, delving for clues into the experiences of other peoples, of other times; reaching out behind and around a materialistic universe for truths which science ignores; getting closer to nature which we have exploited shamelessly (see our destruction of forests, our pollution of rivers and wasting of fertile lands) and using with tact and understanding all that nature offers. All that, and much else, would be expressive of architecture which is truly Modern, that is to say, creative.

In America no real taste of Modern architecture has yet been experienced. In this country the commercialist was swift in seizing upon it and offering it as an additional style over the architect's bargain counter, thus thwarting at birth any chance it might have had at a natural development. Because Modern architecture is founded on truth, however, it is finally outwearing the faddists. It is belatedly coming out here and there in its true form, not as a white cube but as common sense, livability, aptness, excellence of plan, space, and light. It is taking hold at a time when the country is in a state of confusion socially and financially. The clientele has changed, the wealthy individuals abandoning the field to the masses and their housing problem, to the government and corporations and their projects, all of which will some day have to be wrested from the hands of mere materialists. In part cause, and in part result, of the state of social and financial (Continued on page 366)



Concrete block as used in a chapel stairway. Above: Concrete steeple of the same chapel



Instinctive Music

Is the Art of Bird Song Entirely Artless? Slow-Motion Pictures of Sound Suggest an Answer that Bears on Our Own Music as Well

BY SYDNEY E. INGRAHAM

EARLY in the morning or late in the evening, all through May and June, one can hear the song of the wood thrush, repeating a few notes over and over again in phrases separated from each other by long pauses of silence. Each cadence ends with reverberations floating far into the distance — if one is very close to the bird, one can see the continued fluttering of his throat.

Many birdcalls are monotonous, but this song is free and untrammelled. The wood thrush is not a machine singing an automatic set of notes as a music box does if the button is pushed. The essentials of music are there — one can actually hear the notes of our common chord (do mi sol do') disarranged in various permutations — but familiar intervals are mingled with others that seem unfamiliar. To our ears, there is always something elusive about a bird's song, which cannot be imitated on any piano. Then the question arises: Is the thrush singing all in one key, or does he shift? In our own music a melody is usually set in a certain key; that is to say, all the notes are related by means of a scale to a fixed tonic — the pitch from which the song starts out and to which it returns (do, or C

in the key of C). Are birdcalls related to a tonic in this sense, and do birds sing according to any particular scale?

To some extent these questions can now be answered by means of such study as is embodied in the graphic charts illustrating this article. These are based on sound photographs, with the musical intervals, the rhythm, and the dynamics traced exactly as the birds sang

them. The graphophone records and the sound films that have been used in preparing the charts are owed to the generosity of Albert R. Brand and his associates at Cornell University. Several years ago Mr. Brand published an article in which he explained how he counted the vibration frequencies on the sound tracks of his films in order to ascertain the exact pitch and range of the songs of various species, and his method opened many possibilities; it seemed that it might be used to throw some light upon the very nature of instinctive music as compared with art music.

No doubt the work of frequency counting sounds tedious; actually it is very absorbing and full of continual surprises. The essential structure of instinctive music can be studied with an added depth of dimension, not merely through powerful instruments but in the new light of another sense.

Various technical means have been tried out: a microscope on a graphophone record, a microscope on sound film, or the lens of a movie projector to magnify sound track on a screen. Lately, Dr. Paul Kellogg of Cornell has provided for study a highly magnified paper print of a whippoorwill's call, on which five meters of enlarged photograph represent one second of time. The principle is always the same; magnification is necessary in order that the fundamental sound waves may either be measured or counted in relation to a unit of space which, in turn, is related to the speed of exposure. In this way one can learn the vibration speed per second of any note, the frequency number which determines its pitch. For work on the record, the speed of the turntable was calculated, and radial lines were traced dividing the disk into 77 small segments, each with a musical time value of 1/100 of a second.

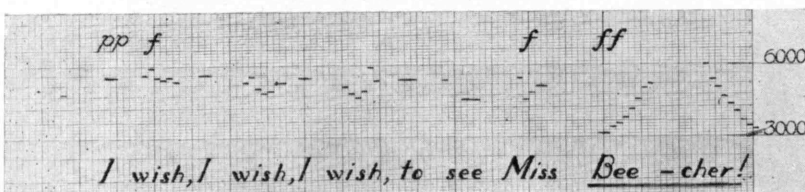
The charts are really slow-motion pictures of sound. The lapse of a second is always marked by a vertical line drawn down from the top. For the most part the width of a chart represents 1¼ seconds, but in a few cases the songs were so long that the unit of space was reduced. In the veery's song the width of the chart represents 2½ seconds; in the wood thrush's song, 7½.

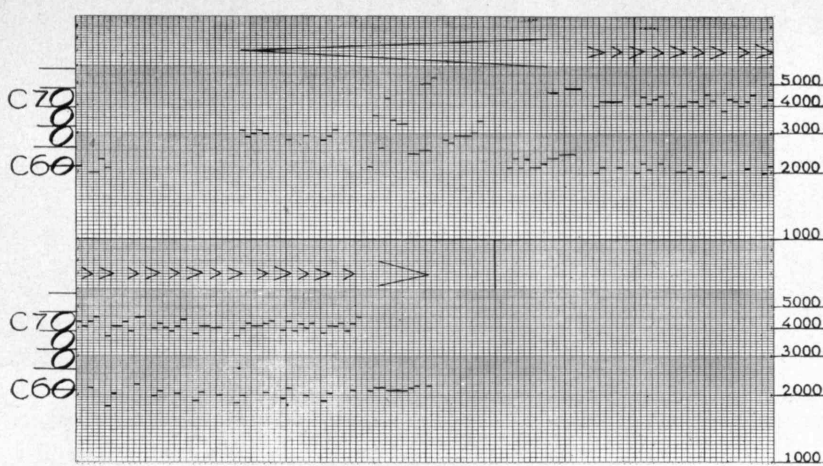
Though the first chart — that for the chestnut-sided warbler — has no special musical significance, it is a representative example of the work. It is amusing to see how closely the song of this warbler fits the catch phrase "I wish, I wish, I wish to see Miss Beecher!" except that we should normally need three or four seconds to say it, whereas Miss Beecher's lively little friend takes scarcely more than one second. The song is much more like an emphatic sentence made up of



National Association of Audubon Societies

The chestnut-sided warbler and a chart of its peremptory song





The automatic octave as rattled . . .



American Museum of Natural History

. . . by the long-billed marsh wren

words than it is like a phrase of abstract music. The rhythm, of course, is very familiar, actually that of iambic blank verse, rising with force and intention to a climax. Harmonious intervals are lacking, but there are complex inflections, ending with the characteristic explosive little slur up and down an octave.

The theory developed as a result of this research is, briefly, as follows: The root of instinctive music may perhaps be traced back to the principle of resonance, or reinforcement of sound. Bird songs are too vague to provide conclusive proof, but the charts suggest that there may be a universal musical sense corresponding to the physical, or natural, scale of overtones.

When a certain length of a musical string or a column of air vibrates simply as a whole, it gives out a note called the fundamental. When it also vibrates in two halves and twice as fast, it gives out an additional note called the first overtone or second partial, an octave higher than the fundamental. The rattle of the long-billed marsh wren seems to be a beautiful case of an automatic octave (see chart above).

This high-strung little creature combines guttural with squeaky effects in an engaging and characteristic manner which is also quite confusing: *Rattle rattle, rattle rattle, rattle rattle, squeak*. When two observers in the marshes are listening to the same wren close at hand, one will swear that he hears a high squeak at the end, while the other may feel positive that the finish is on the lower of the two tones. The musical effect is such as one might hear from the hammering of a xylophone, perhaps because of the resonance of the first overtone, which at times is very prominent.

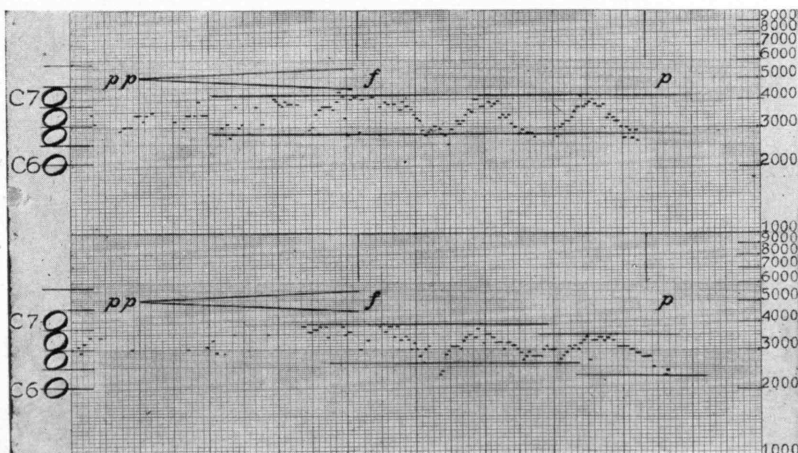
On the sound film there is a characteristic sequence repeated over and over: First appears the simple wavelength of the fundamental as a pure tone; next the same wavelength divided into two parts, showing the first partial; and then one sees the amplitude, or energy, of this partial increasing until, finally, the fundamental ceases and there is left a simple pure tone an octave higher than the first note.

The sequence shows the way in which harmonic musical intervals may be obtained physically from any vibrating cord. Radio engineers can obtain a similar effect by increasing artificially the energy for higher frequencies at the expense of the lower, so that high notes are sounded which have the vibration speeds of what were originally only dominant overtones.

Synchronizing speeds of vibration create a very slight resonance, or reinforcement of sound, in the eardrum, and it is suggested that this auditory phenomenon may serve as a yardstick for measuring pitch, and as a basis for instinctive music and what we call "pure intonation." Our ears may be musically sensitive to the synchronized speeds of the overtone series whether they apply only to multiple vibrations from a single source (overtones) or to all free harmonic vibrations that meet and mingle in the air and fit and flow together. When an octave is played on two instruments, what we instinctively recognize as yardstick for the measurement of pitch is the perfectly synchronized 2 to 1 ratios of the vibration speeds of the two notes. When a fifth (do-sol) is played, we recognize the 3 to 2 ratios, and so on down indefinitely — 4 to 3 and so on — the synchronization remaining perfect, the reinforcement of sound gradually weakening in its effect. Sound waves with their overtones are so complex that imperfect synchronization produces a microscopic chaos, and this out-of-tuneness can be photographed; at times it is almost painful to a sensitive musical ear.

According to the modern "resonance theory" of hearing, we hear by means of 24,000 vibrating fibers in the human ear, which is shaped like a minute grand piano; the shorter fibers are more taut, the bass fibers looser. Each fiber vibrates more strongly to a reinforcing sound wave of its own speed. Birds have only 3,000 vibrating fibers, but their mechanism is similar and their hearing is very acute — as anyone knows who has ever tried to identify the markings of a very small, rare, and shy warbler. It seems not impossible that birds may have a rudimentary sense of pitch roughly

Continuous wild fluttering of pitch in the song of the veery

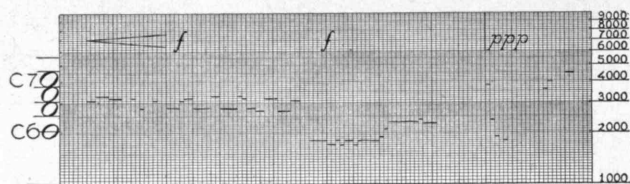


American Museum of Natural History

The hermit and (right)
the wood thrush, with
their respective songs



National Association of Audubon Societies



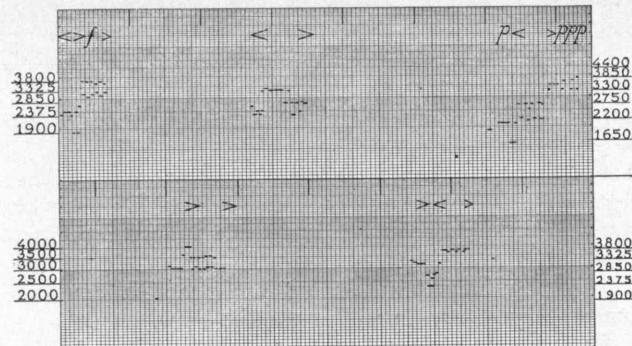
similar to our own, sensitive to the lower overtones through the principle of resonance. Their throats are highly specialized for singing.

A more complex result of this specialization is to be seen in others of our charts. When the length of a string vibrates in three parts, it gives out a note called the third partial, or second overtone, and the interval formed by the second and third partials is called a fifth. In several phrases of the veery which were charted, it was found that pure fifths (speeds in ratios of 3 to 2) were repeated 11 times.

The call of the veery, the harpist, usually has a dying fall in descending fifths (sol-do), but the song studied happened to be rather monotonous, the slurred line zigzagging back and forth across the same interval, with only a slight downward tendency. In eastern Europe there is a bird of the thrush family, known as the false nightingale or garden mocker, which sings the same pattern of song but ascending instead of descending, and the trembling slurred fifths are also said to sound like runs on a harp.

On the chart (preceding page) the veery's tremolo is a continuous, rather wild, and irregular fluttering of pitch, unlike the vibrato of the whitethroat, which is a matter of loud and soft dynamics. The wildness of the veery's call is also enhanced by its introduction, a vague teetering sound which begins very softly on the tonic and rises crescendo to a flatted fourth before it touches the pure fifth which is the dominating characteristic of the song.

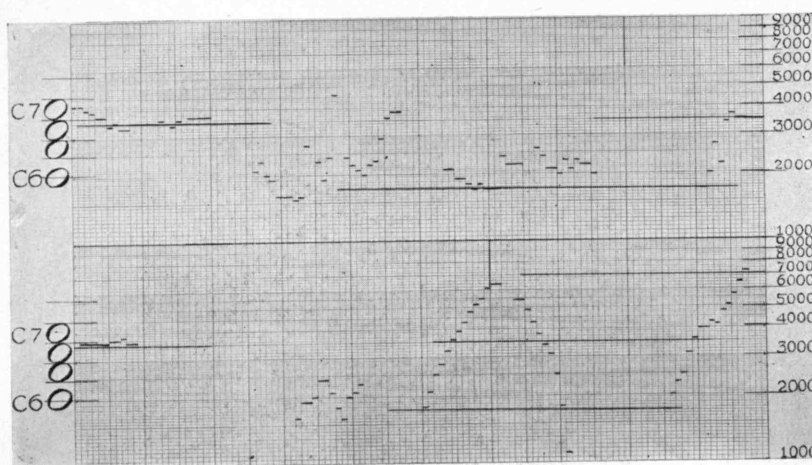
The films show that birds can change the pitch of an interval or even shift the whole pitch of a musical phrase. Mr. Brand found that the winter wren, a brilliant little pea-sized brain, sings a dashing and complex song divided into two halves, the second half a repetition of the first at a different level of pitch. This evidence of an inherent capacity to transpose is surprising and extremely interesting. All musical intervals are merely



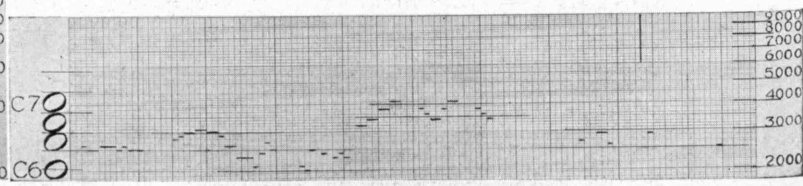
relative values, depending on a fundamental speed that is a variable; furthermore, our whole standard of pitch is a *ratio* standard. Music is concerned with time, or speed, in entirely different dimensions. Rhythm is one thing, pitch another; our standard of pitch is a yardstick for measuring very minute and very rapid intervals of time, and apparently our apprehension of these as high or low notes is, in a mathematical sense, a relative standard.

Usually the well-tempered scale is the only one that is described as "logarithmic." In this work it was found that not merely one scale but all scales, all musical notes, must be plotted logarithmically — that is to say, on ratio paper — if their vibration speeds are to be spaced accurately to represent our natural sense of pitch. On the semilogarithmic paper used for these charts, arithmetic increases are referred to lines drawn gradually closer and closer together as they rise, in such a way that all equal ratios of numbers, high or low, are represented as equal vertical intervals on the paper. This last point is of basic significance musically. One can draw the inference that not merely a single scale but the ear itself is logarithmic, economical of its resources, and able to assimilate steep variations of speeds in relatively small space.

Fig. 1 (page 372) presents the overtone scale adapted to the musical symbolism to which we are accustomed. The musical intervals draw gradually closer and closer together like the lines on semilog paper. The notes of every octave are repeated in the next higher octave with finer intervals between, doubling their number. The frequency numbers double with every octave, and the series is infinitely variable; it could be continued until the notes would seem to us to coalesce into a continuous slide. Mathematically this is a simple arithmetic series, in which the unit of increase remains identical with the vibration number or speed of the fundamental — which, however, may vary widely. (Continued on page 372)



Songs of the brown thrasher (left)
and the olive-backed thrush



A Technology of Trade

Principles of Business May Be Related to Analogues in Engineering and in Science; Neither Moral Nor Immoral, They Propose Rather Than Restrain

BY WILLIAM A. RHODES

CERTAIN principles of business resemble laws of mechanics, electricity, optics, and so on. Others are not unlike the table of elements and the various classifications of the properties of materials. Both are the concern of the technologist, for he is by definition an industrial scientist. Though, for all of the effect the products of his work have upon civilization, he deals primarily in nonhuman affairs, he often, ex officio, finds himself thoroughly entangled in business too. Possibly principles such as the following may therefore at least serve him evocatively in the direct decisions he is called upon to make within the field of human behavior.

The first of a group of such principles which I would offer is a generalization of Ohm's law, which has been known for many years but which I first heard in a physics lecture by Professor Charles R. Cross, '70:

(1) *Result is proportional directly to effort and inversely to resistance.*

This is a most salutary law. If result is inadequate, effort may be increased or resistance reduced or both, but something has to be done. If sales are off, greater selling effort may be made or sales resistance may be reduced by presentation in a new territory, for example. If sales effort is already high — a frequent situation — then there is nothing left but reduction of sales resistance, which, after all, will accomplish the same change in result.

If production costs are too high, greater working effort may be made by existing working forces, or other more able forces may be chosen for the work. Or resistance to production may be reduced by a selection of operations better adapted to the workers, by alleviating severe working conditions, by removing hazards, and so on.

(2) *Retail selling is a necessary adjunct to production.*

Daddy may not want a new dress, but mother does; so daddy works for it. Cutting down breadfruit trees, as has been done recently, is another method of arousing ambition. But this was the idea of a management unaware of the power of (2), or live retailing would have been tried instead.

(3) *Changes in organization or in sales or in production must be conducted step by step, and adjustments must be made based on the result of each increment of change.*

There is a great deal to be said about taking one's time, but (3) does not say it, for (3) is a method of accomplishing results most rapidly. A skyrocket goes up by increments, constantly adjusted by its rudder. It comes down, too, and so does a business if the propelling and the steering effect of management are allowed to cease.

(4) *There is an unlimited amount of profitable work to be done at the present time, not a limited quantity — to be divided.*

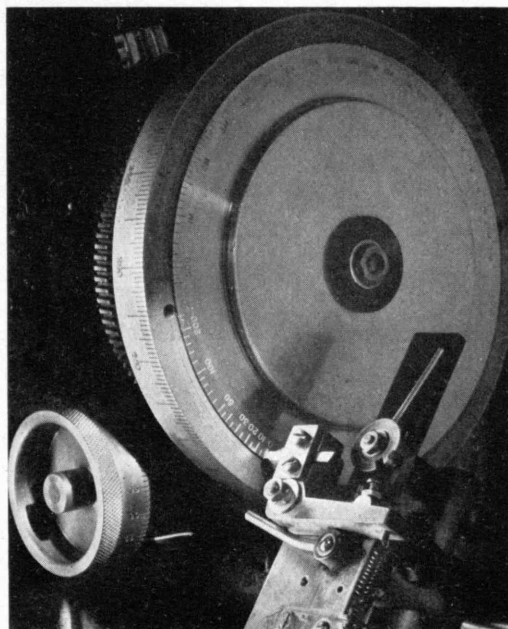
(5) *The total amount of income is not a limited thing — to be divided. There is as much potential income as can be made, and the total depends upon the total of profitable work accomplished.*

Consequently it does not follow that A by working takes work away from someone else; nor does it follow that if A makes money, someone else must lose it. The conscience of the idle man should trouble him, nor is his life a sacrifice. But the busy man, truly earning an income high or low, may indeed sleep well o' nights. He adds his bit to the total of prosperity during his waking hours. And he cannot increase the money he makes without increasing, either directly or indirectly, the work done by others and the money made by others.

(6) *The working characteristics and the buying characteristics of populations vary with regional average income.*

A rich country or the rich section of a country is the readiest producer of those things requiring for their production costly and elaborate plant equipment, and is the best builder of the costly and elaborate plant equipment, too. The goods best made within a high-wage region are materials, chemicals, hand tools, household utensils, and metal and plastic parts turned out with very little direct labor, as well as retail articles of the cheapest kind — to many people the most satisfactory kind.

Countries poor in average income — Mexico or China or Puerto Rico, for example —



are the best producers of articles requiring the highest percentage of hand labor. The production of straw hats, drawn work, embroidery, hand-wrought pottery, cut diamonds, embellished leather and brass work, and the assembly of mechanisms and of instruments (far too little of this latter is done) are performed with uncanny skill and for uncanny pay.

Most regions are not extreme; they are neither the richest in average income nor the poorest. Most goods are not extreme; they are neither entirely machine made, packed and ready for delivery, nor are they built by human hands alone. But each finished or semifinished kind of material in trade, each article and each part of each article in commerce contain percentages of direct plant cost and of direct labor. The greater the content of plant cost, the richer in average income should be the region where the thing had best be produced.

A rich land is the most ready market for goods produced chiefly by hand, a poor land buys most readily goods made almost entirely by machine, and places of intermediate average incomes are most ready in their acceptance of commodities intermediate in their hand- and machine-made content. So a firm building typewriters or radio sets or electric meters or airplanes — all of them composite products of a kind where parts are produced by machine with assembly a later operation, and all of them containing a considerable percentage of hand labor — would be well advised indeed to look into the matter of making or purchasing materials and parts in one place and of seeking a location within a low-wage region for assembly prior to sale elsewhere. Certainly for composite products at all movable and retailing at more than a thousand dollars a ton — I should say this figure is quite high — two freight shipments would not be great compared with the economies of hand labor available in distant lands, and a very material reduction in over-all cost by distant assembly should be anticipated. In Mexico now, assembly of airplane parts made in the United States is under way. The Mexican government is to receive half of the profits of all foreign sales. There is practically no plant equipment to expropriate.

(7) *The working characteristics and the buying characteristics of people vary with the people's age.*

Considering only adults and disregarding senility, there is to be found a gradation in working and buying characteristics by age which closely parallels gradation by regional wealth. Young people are better at repetitious operations; oldsters, in the responsible handling of expensive plant. Youth has ideas, strange and new — to it — in a strange, new world. But the inventions and the decisions of the mature, while fewer perhaps, are the more effective in lasting accomplishment. Youth best obeys directions; maturity best supervises and directs.

Young people for all of their liveliness buy more conservatively, more like their neighbors. Those not so young are more likely to try something new. Young people are the poorer, and the goods they buy more machine made; the older ones are the richer as a group, and their purchases contain the more hand labor. Variation by regional wealth and variation by age, (6) and (7), present a montage of the field of commerce. But by far the most neglected and by far the most profitable to attend to at the present time, even approximately, is

variation by regional wealth. Attention is already paid quite closely in business to the age-variation principle, (7), and it is a principle that will never change. Fast fingers will always be faster in youth. Experience in life will always be valuable.

Money is to be made in the utilization of the most valuable resource of any land, i.e., the potential working ability of its inhabitants. Money is to be made by shipping to the people of the poorer regions materials and parts to be fabricated, whenever the cost of shipment of materials to them and the cost of subsequent shipment of finished products away to market are justified by the excellence and the economies of their work — which is very often the case. And money is to be made by the sale of completed machine-made retail goods to the populations of the poorer regions, paid for in money obtained through the work the inhabitants perform.

But taking work to people of a region and selling them goods they want and can afford and use, will change the region's characteristics. Gradually wages increase. Gradually education increases. Gradually experience is gained by the inhabitants. Gradually civilization advances. Gradually the kind of goods sold changes. Gradually the kind of work performed changes. Gradually regional differences grow less because the poorer sections advance faster than do the richer. And as an end result the age variation becomes of greater importance to management than do regional differences. But not for a number of centuries, I should judge. There are too many poor regions to be elevated.

A corrective principle is to be added to the montage:

(8) *Throughout any region composed of cities, towns, and rural sections, although average income varies with population density — the average city income being the greatest and the rural average the least — producing and buying characteristics remain fairly constant.*

There may be a natural justice in these average-income statistics, and the city man may thus be compensated for exhaust gases, soot, and noise. But manufacturers need not look, as many of them have done to their loss, for the best assembly labor in the farming area of a wealthy state because wages are less than city pay. Nor need a seller underestimate the buying habits of the farm population of a wealthy area with respect to keenness of buying and quality of purchases. That has been done, too, to the seller's loss.

(9) *To market a new article, the first sales should be of the most costly variety and within the richest region, then of less and less expensive varieties to poorer and poorer people.*

There is little money to be made in wealthy trade and little to be lost in testing such business. The money is to be made in quantity sales. But first the habit of use must be established in the richer areas and among the richer inhabitants. Poorer people in their buying imitate the rich. And the richer places are the less conservative — in their buying — than the poorer. Cuba and Peru are still mid-Victorian.

As a corollary to (9):

(10) *There are very few of the instrumentalities of modern life which cannot profitably be sold in simpler form to the people of poorer regions. And not infrequently more costly varieties may find enough sales among rich people to justify being marketed too. (Continued on page 370)*

The Deadly Guest

The Menace of Fire in the Home Challenges Common Sense

BY DONALD HOLBROOK

HAZARDS TOO EASILY IGNORED—THE POSSIBLE COST OF MERE EYE APPEAL—THREE FACTORS OF SAFETY FOR CONSIDERATION BY ARCHITECT AND ENGINEER

BOX 231 was striking on the tapper. The cold winter air coming in my bedroom window made me shiver as I hustled into rubber boots and ran down the hall stairs, pulling on my coat as I went. In a few seconds the car was started and I was on my way. The scene of the fire was not unusual: a new brick home with every modern convenience, on which architect's design and manufacturers' skill had lavished countless devices for comfort and the saving of physical energy. The fire was in the kitchen, started by a forgotten electric iron.

The child in the bedroom above was dead. So was the collie lying at the foot of her bed. The child was not burned; those who die as a result of fire rarely are. The flames had extended barely from the kitchen to the hallway, and were extinguished in short order upon the arrival of the fire apparatus. Concentrated heat, followed by stifling smoke, had been enough. Mercifully, probably neither child nor dog had awakened.

The only other member of the household present — a nurse — was having hysterics in the arms of a policeman.

NOW it is fair to ask: Do tragedies like that recounted in this true story really happen frequently? Unfortunately, the answer is yes — far, far too frequently in the United States. So frequently, in fact, that a death by fire in a private home, unless it is spectacular, rates little more than a few lines of mention on the back page of some newspaper. Ten thousand deaths a year from fire hardly compare, of course, with the number of fatalities through automobile accidents, and even these, unfortunately, are no longer important news.

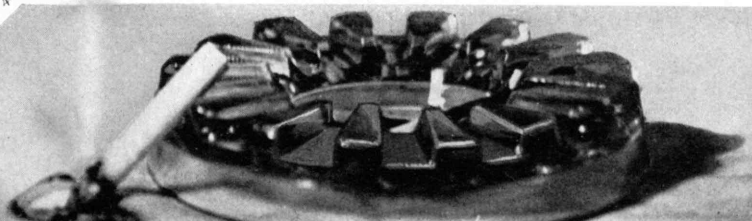
The next logical question is: Who is to blame? To this we must answer: the average American citizen, whose apathy is beyond belief; the so-called intelligent minority, who say, "It won't happen to me"; and particularly the architect and engineer, for whose negligence there is no excuse.

American houses are noted for their comforts, for the completeness of their equipment, and for the development of many mechanical conveniences. Improvement of building materials, efficiency

of design, and varied approach to individual tastes have reflected our growing desire for better and better things. Architects and manufacturers have not only stimulated these improvements through research and design but have kept pace with modern developments in fire prevention. Fire-stopping of walls, use of fire-resistive materials in roofs and partitions, better treatment of chimney spaces, and adoption of varied forms of slow-burning or fire-resistive insulation are but a few of the advances which have been made. Knowledge on these subjects has made effective to a marked degree a broadening defense against fire, whose dreaded and unexpected visit is impartial to rich and poor alike. One cannot dismiss this visitor lightly, because he calls on some home every two minutes of every day and night, and his visits mean, on the average, one death every hour. The layman and the professional houser have not been alone in working for the improvement of home fire prevention; municipal governments also have participated. Building laws have become more stringent in regulations designed to safeguard health and limit the hazards of fire.

In spite of this indicated progress, more than ten thousand lives a year are lost as a direct result of fire. About two-thirds of these fatalities occur in the private home; 30 per cent of the victims are children under ten years of age. There is something inconsistent in the undoubted improvement in the character of American homes, on the one hand, and, on the other hand, this almost steady trend of fatalities directly attributable to fire. That so many fires occur in the home is not surprising. Human beings live in it, smoke in it, and use matches and other fire-generating gadgets the misuse of which affords plenty of opportunity for fires to occur. We cannot blame our fire departments for this appalling loss of life, for statistics plainly indicate that most deaths occur before the arrival of the fire apparatus, even before the department has been notified. Moreover, the record shows that comparatively few fatalities are directly caused by burns.

Too often the design of houses provides unsatisfactory means of protecting life when fire occurs. Too often we are satisfied with having taken precautions to preserve the building itself from flames, and we forget about efforts to preserve life from heat and gases. Temperatures can reach more than 1,000 degrees during a building fire, and firemen frequently have to operate in conditions between 200 and 300 degrees. In addition to the obvious menace to life suggested here, it is safe to say that in any house involved in fire, a number of gases are released.



Combined with smoke, these gases may in themselves present a grave danger to the inhabitants and to firemen. The amount of pure air by which such gases are diluted largely determines the seriousness of the situation to human lives. Carbon dioxide and carbon monoxide are present at almost all fires.

Carbon monoxide by itself, of course, is a deadly gas if it is inhaled in any concentrated amount. Fortunately, however, the amount of it released in most fires is not alone sufficient to cause death.

When, however, carbon monoxide is mixed with a generous proportion of carbon dioxide (and the latter, curiously enough, is not in itself particularly poisonous), then we have a really dangerous situation.

In the average house fire, we may have to deal with woolen fabrics and upholstery, as well as with various kinds of wood and paper. Besides producing carbon dioxide and carbon monoxide, woolen fabrics during combustion produce hydrogen sulphide, hydrocyanic acid, ammonia gas, hydrocarbons, and hydrogen in varying amounts. Cellulose materials, which include paper and wood, are likely to produce, in addition to the gases already mentioned, acid gaseous bodies dangerous during short periods of inhalation and imparting to smoke its acrid and tear-producing qualities. Carbon monoxide and carbon dioxide are, of course, both odorless and practically tasteless, so that there is little warning of their presence. Hydrogen sulphide, which may be produced by certain types of fabrics, gives off an odor commonly associated with that of rotten eggs and therefore affords definite warning of its presence. Hydrocyanic acid, it is well to remember, is the lethal gas used in the execution chambers of some of our western states.

Consider what would happen in the process of combustion of rubber insulation which, of course, exists in large quantities in any house where there is electric wiring. The atmosphere produced by the combustion of this material in combination with large amounts of oxygen may be in sufficient quantity to cause death when inhaled even for a brief space of time. In the average home there are many materials besides those already mentioned, as, for example, celluloid, which produce dangerous gases. Only a small amount of material burning under the right conditions may cause a fatality. I have seen an elderly woman dead, sitting in her chair in a corner farthest removed from the only object involved in the fire — a mohair sofa — the firemen having to use gas masks in order to obtain access to the room.

Now this is clearly a bad combination — of intense heat and suffocating gaseous smoke. But it is further complicated when it occurs because of fire in the usual dwelling. The heated air and gases naturally rise upward through the building; stopped by the roof, they mushroom laterally, their pressure increasing and making the possibilities of escape still more arduous. In an open field, one can stand fairly close to a large bonfire and suffer no injury, because in the open the rising heat and gas are not restricted. Let even a small fire get under way in a closed room, and within a very few minutes it will be impossible to approach. This is why

the fireman chops a hole in the roof — to relieve pressure and turn the mushrooming hot air again into a vertically rising column, so that he may get in at the base of the fire with his hose. And this is the situation which justifies our consideration of three dramatically important factors in house design.

In concentration upon eye appeal and creature comfort, these may easily be ignored and are ignored too often, as the fatality lists demonstrate. Whatever is done in the way of fire-stopping walls, safeguarding furnaces, providing fire-resistive storage space, using only proved electrical wiring and appliances, and incorporating similar safety measures into the home is, of course, excellent. But it must be remembered that fire may, and does, start in spite of all these precautions. It is to give the sleeping child a chance of escape from heat and gases that I would urge the consideration of these three factors in house design: (1) Make possible the physical ability to escape; (2) provide means of escape; and (3) provide the adequate warning without which the first two factors may too easily be but idle gestures.

Physical ability to escape depends primarily upon ventilation. Roused in the middle of the night, choked by smoke and gas, the fire victim is badly handicapped by fright and by bodily distress. Add to these heat and pressure, swiftly increasing because of a lack of ventilation, and his chances dwindle rapidly. Since in the average house the stair well is about the only location where a ventilating shaft for the escape of heat and gases may be provided, the current tendency in house construction to shrink the size of the hallway in order to permit the employment of space to better advantage has serious shortcomings. Many houses, moreover, do not have two flights of stairs, and the additional flight in those which do, though it originates in some other part of the ground floor, usually ends at the second-floor hallway. The stair well as it exists in most houses is one of the greatest hazards to life when fire occurs.

It therefore seems logical, in designing a central staircase, to provide for immediate and automatic ventilation in case of fire. This can best be secured by installing an automatically opening skylight in the ceiling of the stair well, the skylight to be hinged against spring pressure and released by a fusible link which will melt at a certain temperature. It is perfectly feasible to design a skylight which can be attractive and useful as an entrance for light as well as a great protection to the occupants of the house in case of fire. A skylight of this kind can be adapted to many existing houses without great expense. The ventilation afforded by such a device may be expected to keep the central staircase usable as an escape if the fire is confined to the basement, for example. And ventilation thus provided will help to prevent the spreading of the fire laterally through the second story of the house, even though it may contribute somewhat to speeding the flames vertically.

Long before the heat of the stair well of a house involved in fire reaches the temperatures pictured by Kearney and Dougherty in their (*Continued on page 380*)

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE



Professor Charles E. Locke, '96

Appointment

CHARLES E. LOCKE, '96, Secretary of the Technology Alumni Association since 1930 and for many years a member of the Faculty of the Department of Mining Engineering, has been appointed acting head of his Department. He succeeds W. Spencer Hutchinson, '92, who retires this month with the title of emeritus professor.

Professor Locke is known to Technology graduates throughout the world, and as a mining engineer he is internationally known as an authority on treatment of ores and has long been in charge of this branch of mining engineering education at the Institute. Following his graduation, he was engaged by Professor Robert H. Richards, '68, then Head of the Department of Mining Engineering, to assist him in the preparation of a book on ore dressing. Professor Locke became a member of the Institute's teaching staff in 1901. He is a former president of the Locke Family Association, and in addition to his duties as secretary of the Alumni Association, has been secretary of his Class for more than 20 years, faithfully submitting notes for each issue of *The Review*.

He is a member of the American Institute of Mining and Metallurgical Engineers, the American Society for the Promotion of Engineering Education, the American Association of University Professors, the Australasian

Institute of Mining and Metallurgy, and recently was elected an honorary member of the Mining Institute of Japan.

Criteria

IF you, like the Massachusetts Institute of Technology, can find and flower a man like Karl Compton, or, like the California Institute of Technology, can give scope to a man like Robert Millikan, then you will become a great institution." Former President Herbert Hoover set forth these criteria in a recent address to alumni of Northwestern University, in referring to Northwestern's plan to add an institute of technology to its educational armament. A program in honor of Dr. Walter Dill Scott, retiring President of the university, was the occasion of Mr. Hoover's address. Increased research in pure science was advocated by the former President as a means of offsetting technological unemployment.

Future Administrators

AWARD of Alfred P. Sloan Foundation fellowships to ten young executives chosen from a group of 184 nominated by industries throughout the country was announced by President Compton on May 13. The recipients will begin their work at Technology early this month. These fellowships have been established with a grant of \$32,500 by the Alfred P. Sloan Foundation of New York as one phase of its endeavor to promote the increase and diffusion of economic knowledge. This year's grant is more than double that of last year under which five Sloan fellows are now completing their program of study.

The recipients, each of whom must have had at least five years' industrial experience since graduation from a recognized engineering or scientific course, will spend a year at the Institute in a program of study which expands the concept of the management function to include not only executive skill but an understanding of the social and economic implications of industrial responsibility. Supervision of the fellowships will be carried on by Professor Wyman P. Fiske, who has been appointed director of the Sponsored Fellowship Program.

The successful candidates for the fellowships are William L. Clark, an assistant superintendent in the Columbia Steel Company, Pittsburg, Calif.; James H. Campbell, a power and lighting engineer with Consumers Power Company, Lansing, Mich.; Russell De Young, a development engineer of the Goodyear Tire and Rubber Company, Akron, Ohio; Richard T. Orth, head of a designing section of the R.C.A. Manufacturing Company, Harrison, N. J.; Charles E. Wampler, district traffic superintendent of the Illinois Bell Telephone

Company, Chicago, Ill.; Joseph R. Bransford, who is in charge of a development and planning section of the Western Electric Company, Kearny, N. J.; Joseph T. Cosby, Jr., of the engineering staff of the Consolidated Edison Company, New York City; William T. Putnam, manager of the W. T. Grant Company's store at Charleston, S. C.; Samuel W. Stouffer of the operating staff of the Jones and Laughlin Steel Corporation, Aliquippa, Pa.; and Robert N. Zimmerman, project engineer of the Transcontinental and Western Air, Inc., New York City. All the Sloan fellows have been granted leaves of absence and will return to their companies next year.

The committee which chose the fellows was composed of Edward L. Moreland, '07, Dean of Engineering; Edmund C. Mayo, President of the Gorham Manufacturing Company; Harry M. Goodwin, '90, Dean of the Graduate School; Ralph E. Freeman, Head of the Institute's Department of Economics and Social Science; and Professor Fiske.

The program of special studies which the Sloan fellows will undertake was developed under the leadership of Professor Erwin H. Schell, '12, and will cover a 12-month period. It will start with a study of the fundamental elements and functions of industrial activity, including principles of economics, business law, business finance, marketing, production, accounting, and industrial relations. This will be followed in the fall and spring by a schedule which departs somewhat from the usual academic program. In addition to formal study, which will emphasize the responsibility of industry to society and the external influences bearing on industrial administration, the schedule will include, first, an extended investigation of some topic of interest and significance to industry and, second, a series of conferences with at least 30 leading American industrialists, government officials, and labor leaders.

Architectural Prizes

THE Rotch Travelling Scholarship, which carries a stipend of \$2,500 for study and travel abroad for a period of 15 months or more, has been awarded this year to William E. Hartmann, '38. With the exception of three years, students of the Institute's School of Architecture have won the Rotch scholarship every year since 1926. This year's problem for the scholarship, one of the highest honors in architectural competition, was the design of an airport station near Boston. Hartmann, who is the son of Mrs. John A. Hartmann of Somerville, N. J., has been employed in different architectural offices since graduation and is at present working for Professors Lawrence B. Anderson, '30, and Herbert L. Beckwith, '26, architects for the M.I.T. field house, swimming pool, and gymnasium unit.

The jury was composed of Charles Butler of New York City, a fellow of the American Institute of Architects; Edward D. Stone, '27, also an architect of New York City; and Andrew H. Hepburn, '03, of the Boston firm of Perry, Shaw and Hepburn. They awarded second place to J. H. Saunders, Jr., Harvard '39, and third place to a Technology graduate student, Charles A. Blessing, '37.

Victor Curtis Gilbertson, '36, who was a graduate student at the School of Architecture in the academic year 1935-1936, has been awarded the \$1,500 James Harrison Steedman Fellowship in Architecture, offered by Washington University in St. Louis, Mo. He will travel in Europe for ten months, studying architecture, taking pictures, and making sketches. The subject of the Steedman competition was a school of fine arts in Washington, a theoretical problem for the design of a school which would serve to foster friendly relations between the United States and other American countries through an exchange of culture. Final selections were made by a Princeton University jury which was composed of Professor S. W. Morgan, Professor Jean Labatut, and J. André Fouilhoux.

Three of five \$1,000 regional first awards in the Productive Home Architectural Competition in New York have been won by Technology students and graduates. These winners were among 50 recipients of awards for designs selected from the work of more than 506 architects during a preliminary elimination. One of the \$1,000 prizes went to Lois Wilson Worley and William W. Caudill, graduate students in the School of Architecture, who coöperated in making an entry in the final competition. Another prize went to Alexis A. Dukelski, '28, of New York City, and still another to Harry M. Weese, '38, who is now studying at the Cranbrook Academy of Art, Bloomfield Hills, Mich. The contest, which was instituted for the purpose of securing plans for houses calculated to meet the requirements of a semirural productive way of living, was sponsored by the Independence Foundation, the School of Living, *Free America*, and the Homeland Foundation, Inc.

Speaking Prizes

FIRST award in the annual Stratton Prize competition for the preparation and delivery of technical papers by Institute students was won this year by Andrew P. Rebori, '39, of Chicago, Ill., a senior in Building Engineering and Construction. Rebori was awarded the prize for his paper on "Erected Construction," one of six student talks in the final elimination before a general convocation of Faculty and students. Second prize went to David S. Frankel, '39, of Worcester, Mass., a senior in Electrical Engineering, for his paper on "Statistical Approach to the Problem of Job Evaluation." Bernard A. Monderer, '39, of Chicago, Ill., also a senior in Electrical Engineering, spoke on "Economic Problems in Television" to win the third prize in the competition.

The Stratton Prizes were established by the late President Samuel W. Stratton to encourage the writing and presentation of technical papers by students of the Institute. Judges in the final competition were George P. Dike, '99, a member of the Boston firm of Dike, Calver and Gray; W. L. W. Field, headmaster of Milton Academy; Lincoln O'Brien, executive editor of the Boston *Evening Transcript*; and Walter Humphreys, '97, Secretary of the National Association of Wool Manufacturers, Boston, and Secretary of the M.I.T. Corporation.

Adviser to Women

FLORENCE WARD STILES, '22, librarian of the Arthur Rotch Library of Architecture, has been appointed to the newly created post of adviser to women students at the Institute. Miss Stiles will carry on her new duties in conjunction with her activities as head of the architectural library.

Since 1935 Miss Stiles has been president of the M.I.T. Women's Association, the organization of Institute alumnae, of whom there are more than 700 living. She is a native of New Hampshire and was educated in the public schools of Cambridge before entering the Institute. Following her graduation she worked with the staff of Howe, Manning and Almy, a firm of women architects all of whom were educated at Technology. Later she traveled in Europe and upon her return to this country was engaged in architectural drafting and design. Her activities in this field included work in the architectural department of Stone and Webster Engineering Corporation, where she acquired valuable experience in such types of architecture as concrete dams and power stations. In private practice she has been interested in the design of small houses and in remodeling old dwellings. This year she was elected an associate member of the Boston Society of Architects.

Miss Stiles became librarian of the Arthur Rotch Library of Architecture in 1931, and is a member of the Special Libraries Association, as well as the American Association of Museums. In 1937 she was national chairman of the museum group of the Special Libraries Association. Her appointment as adviser to women students at the Institute was preceded by a study of the needs of, and facilities for, women students at Technology.

There are now 50 women studying in various professional fields at the Institute, including biology and public health, architecture, and chemistry. Headquarters for women students is the Margaret Cheney Room, consisting of a lounge and study established as a memorial to Margaret Cheney, '82, who died before completing her course at the Institute. It is hoped in the future to provide additional facilities for the comfort and convenience of women students.

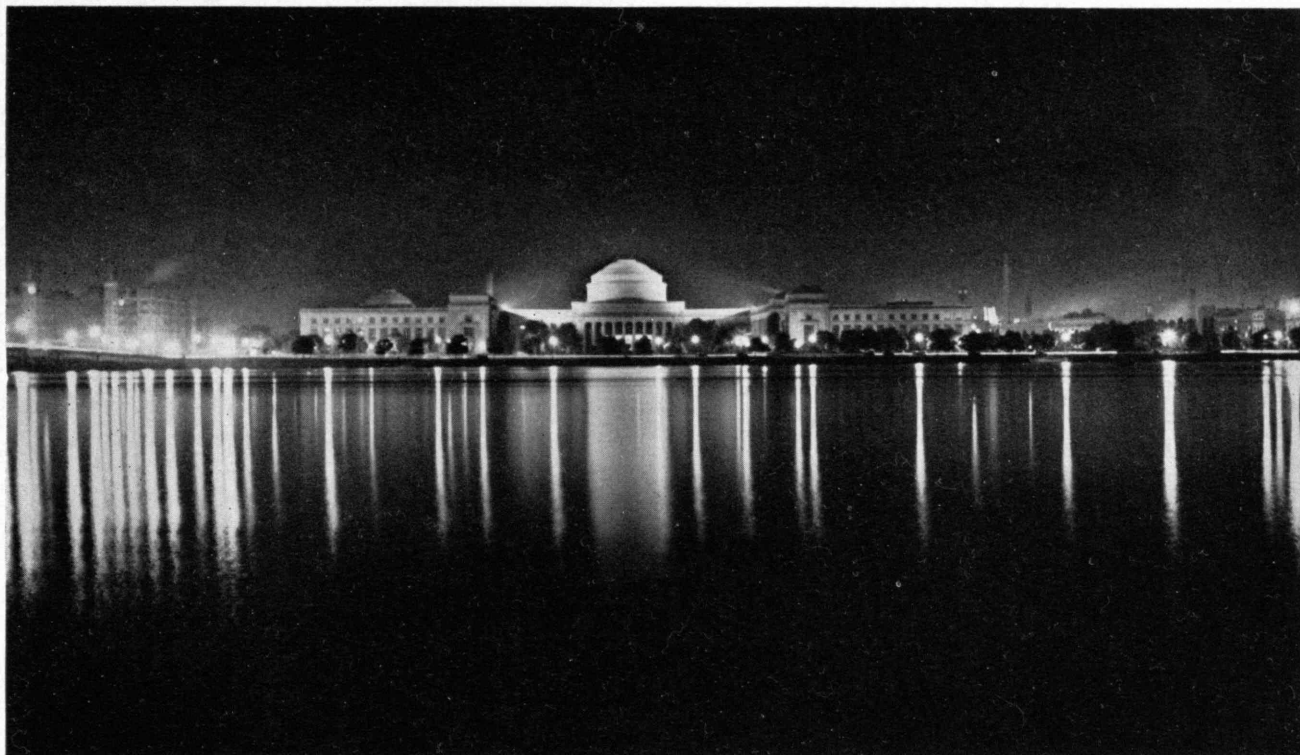
Illusion

THREE-DIMENSIONAL projection as an aid to college instruction was inaugurated last month by the Section of Drawing in a series of lectures wherein students were enabled for the first time readily to visualize difficult geometrical figures through the use of projection apparatus based on the principle of the parlor stereoscope popular a few decades ago.

The product of four years of work by Professor John T. Rule, '21, chairman of the Section of Drawing, the new method employs a double projection lantern and special slides. Each of the slides is composed of two perspective drawings made from slightly different points of view, calculated to be the equivalent of the difference of position of the two eyes in looking at the object to be drawn.

To accomplish the desired effect, the light from the two projection lenses is polarized in opposite planes by the use of Polaroid plates in front of the lenses. Each observer of the projected pictures wears spectacles which have pieces of Polaroid in place of lenses. The spectacles are so adjusted that each eye will receive the polarized light from one picture. In other words,

Pillars of light upon and above the Charles



Edson F. Woodward



For informal convenings — taproom in the new quarters of the Technology Club of New York at 24 East 39th Street

each eye sees one picture exclusively, and the three-dimensional effect results, since the brain interprets an actual scene in space and gives the effect of depth.

The lectures given to the students this spring, to serve the purpose of a general review of the year's work in drawing, made use of 40 slides. These are to be completely revised in accordance with Professor Rule's experience thus far, and a new set will be used next year as an aid in teaching the regular courses in drawing. Also it is expected that each drawing room can be equipped next year with a hand stereoscope and a set of stereographs so that the student may be aided in visualization of any problem on which he is working.

A major part of the work in devising such means of three-dimensional projection is the development of the pairs of drawings to be placed on the slides. The drawings are made five times as large as the slides, and the major errors are corrected after the drawings are checked with prisms. They are then photostated down to one-fourth size and checked in a hand stereoscope for minor errors, following which the master drawings are corrected and then photographed down to one-fifth size for the final slides.

Observers of the first showings of the slides last month were deeply impressed by the effectiveness of the three-dimensional projection which appeared to move the figures right up to the viewers, so that they felt they could reach through them and behind them.

Books

FOR admirable collections of rare and useful books, two Technology students have been chosen winners in the first annual Contest for Collectors, sponsored by the Friends of the Library, that most worthy organization dedicated to the expansion and improvement of the Institute's Library. First prize of \$25 was awarded to L. Charles Hutchinson, '37, of Quincy, Mass., graduate student in Mathematics, for an outstanding collection of rare books on the science and origin of languages. A second prize was won by Amos E. Joel, Jr., of New York City, a junior in Electrical Engineering, for a group of books, patents, and technical papers on the subject of automatic telephony.

THE TECHNOLOGY REVIEW

Announced last December, the contest was dedicated to the promotion and recognition of intelligent interest in books on the part of the student body of the Institute and was judged on the basis of the student's originality, bibliographic skill, knowledge of the field of concentration, and ingenuity in collecting.

Mr. Hutchinson's collection, which the judges believed demonstrated a true collector's interest, consisted of books on linguistics published during a period of 250 years, beginning about 1587. The jury was impressed by the fact that Mr. Hutchinson made his collection of valuable books by the slow process of browsing in secondhand bookstores rather than by the more expensive method of purchase at auctions. Mr. Joel's collection was regarded as an outstanding example of a working group of technical books. The method

by which it was coordinated for use by means of a careful arrangement was particularly remarkable, according to the judges.

Charles A. Blessing, '37, of Boston, graduate student in Architecture, also presented a collection of books on the graphic arts which was commended by the judges, although it did not receive an award.

New Quarters in New York

IN a gaslit restaurant on Cortlandt Street, just a stone's throw from the old Sixth Avenue El, a group of Technology Alumni, none out of school more than ten years, met on an early March evening in 1892. One of these men was the late Alex Rice McKim, '85. His companions were former classmates who had taken up residence in New York City either by choice or by economic compulsion and, finding the city somewhat cold and strange, had formed the habit of meeting once a month.

On that particular night McKim proposed permanent organization. That was the beginning of the Technology Club of New York, one of the oldest and most influential alumni clubs of the Institute. In the years since its organization many more alumni clubs have sprung up in most of the leading cities of the United States and in several foreign countries, and the Alumni Association which embraces these clubs has become a vital force in the affairs of the Institute.

This year the Technology Club of New York again is in the limelight. After spending the ten depression years, well protected from economic storms, in the haven of a mid-town residential hotel, the board of governors recently announced a broad expansion of facilities and removal of the Club's quarters to a modern, completely furnished clubhouse at 24 East 39th Street. The new building is shared jointly by the Technology Club of New York and the Williams Club of New York. This arrangement makes possible the economic stability necessary to insure success of the venture and to provide additional facilities to members without any increase in cost. The building contains a private bar, restaurant, library, lounge, reading rooms, squash courts, sleeping rooms, and barber shop.

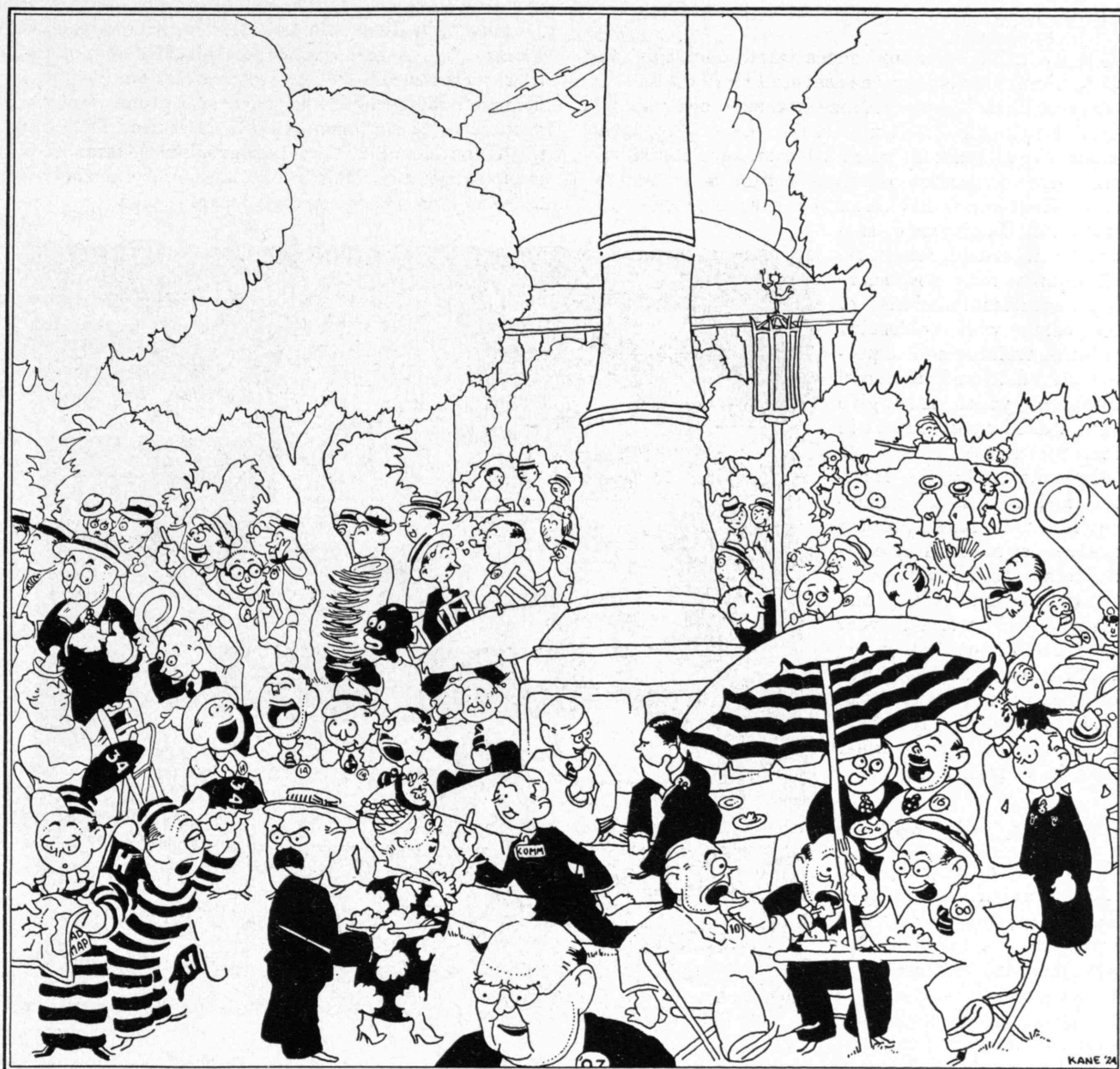
Many of the older members are comparing the new building with the Gramercy Park quarters which the Club occupied for 17 years prior to moving to the Midston House in 1928. It is generally agreed that the present building is not only more modern and up to date but that it offers more facilities and attractions than ever before available. This is attested to by the record number of Alumni and guests who visit the Club daily. One of the building's greatest boons is its central location, just two blocks from Grand Central so that it is conveniently accessible to the hundreds of Technology men who have business connections in this portion of the city.

The Club's private bar has proved very popular. Described as "the most attractive and outstandingly successful bar of its size in the city," it is paneled to its full height in pine, with a floor of wide oak planks and a

ceiling of sound-absorbing material which absolutely eliminates noisy reverberations. Because of its convenience and friendly atmosphere, the taproom has become an oasis and a meeting place for scores of Institute Alumni.

Another attraction has been the Club's well-managed restaurant. The main dining rooms are situated on the second floor and are open daily for breakfast, luncheon, and dinner. In answer to many requests, there is a special Technology Round Table where men who arrive alone, or desire more company, can dine with other Alumni. Several private dining rooms are available for special and class functions.

Outstanding among the Club's rooms are the lounge and library. The former is large, airy, and comfortably furnished, with a wood-burning fireplace for chilly winter evenings. The library, in addition to having a



Alumni Day in anticipation

large collection of scientific books and periodicals, as well as all current magazines, contains a complete file of the Institute's official publications. Members also make ample use of the cardrooms, where several bridge games are in progress every evening. Facilities are also available for chess and ping-pong. Attractive sleeping rooms are to be had as well. The Club has a better complement of sporting facilities than ever before. Squash courts are under the direction of the well-known coach, Walter Kinsella. Members have access to tennis courts and a skating rink, through the courtesy of a neighbor, the Princeton Club.

The board of governors has issued an invitation to all Alumni who come to New York for the World's Fair, to visit the Club. A registration desk will be maintained to enable visitors to determine which of their friends are also in the city at the time.

Opportunity

RECREATIONAL and educational opportunities at Camp Technology, the Institute's civil engineering camp at East Machias, Maine, formerly open only to Civil Engineering students, are to be extended this summer to all students who have completed their freshman year. Regardless of whether they have had the prerequisite course in elementary surveying required of the Civil Engineering students who attend, men from all Courses may now share the recreational facilities of the camp while obtaining valuable training and acquiring an additional skill and technique which may give them added opportunities in their professions.

Established by the Institute in 1912, Camp Technology had as its initial purpose the training of Civil Engineering students in surveying, topography, and railway and highway field work. A year ago, the Institute announced that the use of the camp was being extended to students of other colleges in the East which did not have similar facilities of their own.

Graduates Gauged

THE Graduate School of the Institute, as seen from three points of view, was focus of interest for the 206th meeting of the Alumni Council, which was held in the Dutch Room of the new Graduate House on the final Monday in April. Retiring senior Vice-President Arthur

L. Townsend, '13, presided during the speaking program, the chair having been yielded with due ceremony by President H. B. Richmond, '14. Harry M. Goodwin, '90, Dean of the School, who has had continuous connection with graduate study at the Institute since 1907, surveyed the history of its development. The expansion of graduate work has been reflected in the accommodations for the men, and these were summarized for the Council by Avery A. Ashdown, '24, master of the Graduate House since its organization in 1933. His praise of the new Graduate House was substantiated by the third speaker, Jerry McAfee, a graduate of the University of Texas, now in his second year here as a graduate student in Chemical Engineering.

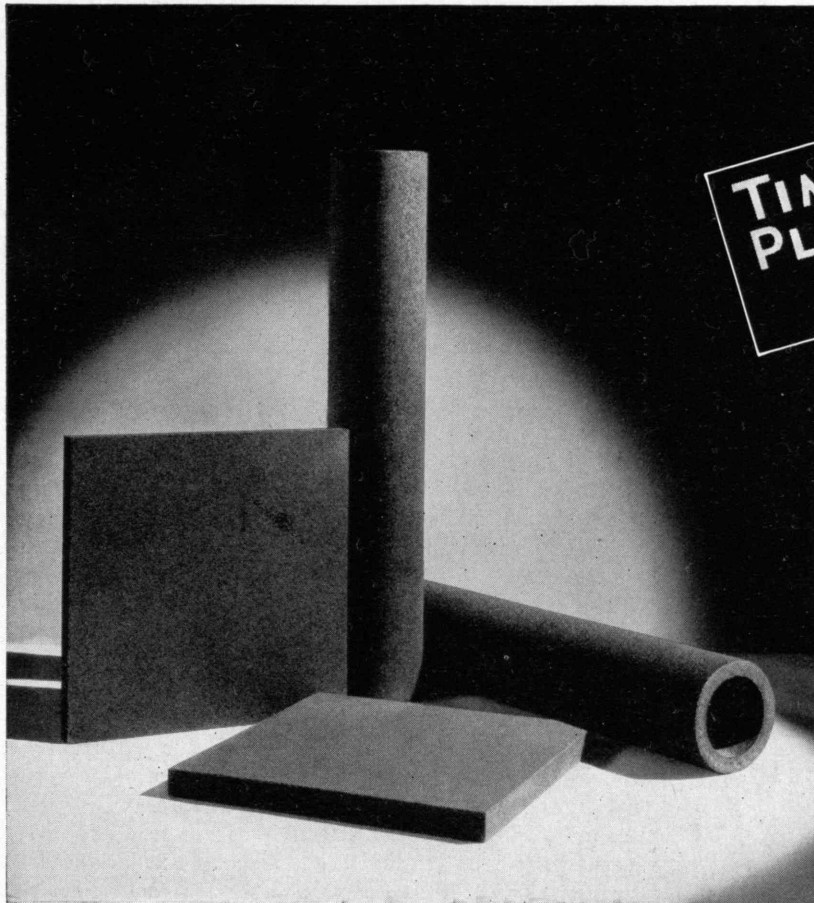
The business of the evening had included announcement of alumni elections, the head of the ticket being unanimously carried, with these results in the contests for three years' membership on the National Nominating Committee: District 3, Alfred W. Hough, '19; District 6, Walter J. Beadle, '17; District 7, Franklin Fricker, '25. A memorial of the old Rogers Building, it was announced, will be embodied in the new gymnasium building and will consist of a stone from the Institute's former home, suitably inscribed. The committee on Honorary Membership in the Alumni Association reported, nominating as this year's recipient of the honor Professor Emeritus Dugald C. Jackson.



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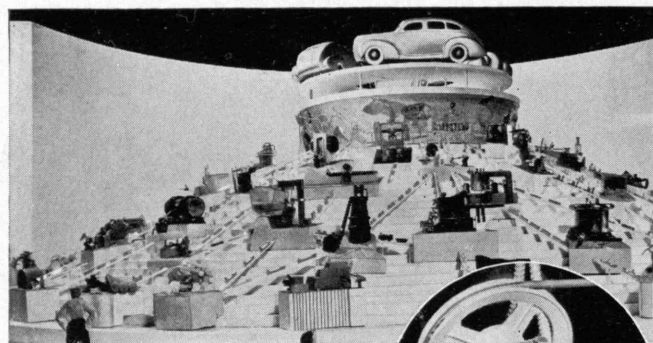
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PHILOSOPHY AND MODERN ARCHITECTURE

(Continued from page 351)



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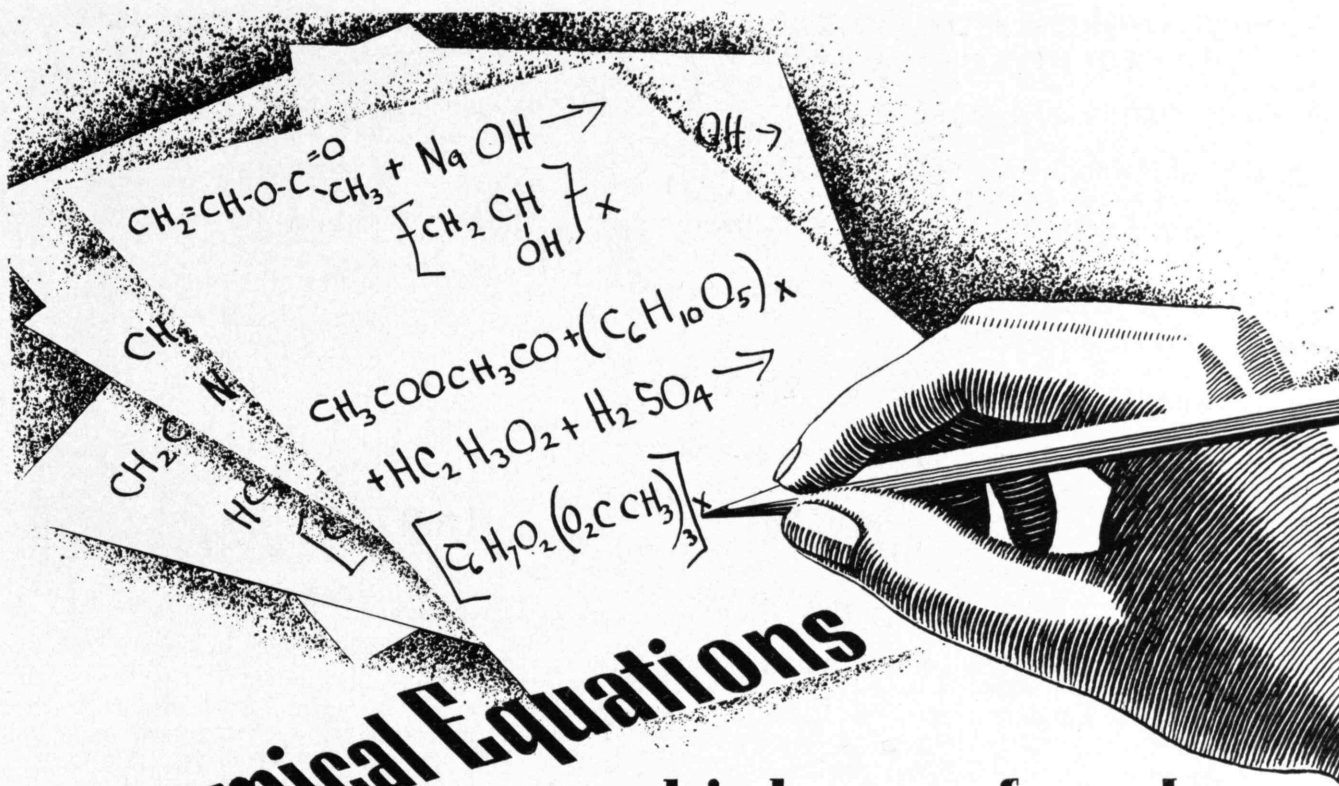
confusion, overemphasis upon selling has hampered Modern architecture in America, not merely through the commercial exploitation which I have mentioned but — more seriously — through its effect on students. When almost every attempt to create is perverted into a method for increasing sales, young people with good intentions and intelligence lose their direction and drift off with the rest, devoured by the same consuming anxiety to sell. Many of them think that, where earning power is prime consideration, they must of necessity divorce themselves completely from higher values. Most of the students leaving the universities and preparing to practice architecture have vision and idealism. They are able to understand the realities of which I have been speaking.

But they come into a world which is incapable and unwilling to understand all that they have learned to cherish. They find that architectural practice is mostly in the hands of interior and exterior decorators belonging to the past era, and that these are well entrenched with the jobgivers, including the government and industries. They find that they will have to work either for the reactionaries of the old guard or the false prophets or, again, on other purely commercial projects. Yet if they keep in mind that the people at large want and need good things and values, that the obstacles are false and therefore must fall under pressure, they will have the courage which will enable them to live through their difficulties.

Always they must take every opportunity to further their cause. If, for instance, the proposition is one calling for the production of cheap houses that must look expensive, to be built of poor materials simulating better kinds, in fancy forms to attract the vulgar, the problem should be faced squarely. It is true that the houses must sell, that money should be made. But wits can be used to foil an ugly plot. One can scheme and maneuver and, by wise planning, slip into these buildings something that was not bargained for: a rational, pure construction which, like the bones of the body, is not apparent but upon which depend all exterior and interior harmony; or an efficient and unpretentious kitchen, the refining influence of which may some day spread to other apartments.

Le Corbusier said that Americans were timid. I think their timidity is due, first of all, to an inordinate fear of poverty, and then to a lack of faith that faithfulness to an idea will carry them through. My firm belief is that solid or stable material existence can be reached only through spiritual realities. In fact, ideas are the basis of material existence. Loss of faith in spiritual realities in this country has been followed by material and social insecurity.

For instance, when a carpenter asks \$10, \$12, \$14, a day for his work and works only about one-third of the days that he might work, even a motorcar and an electric icebox will not make him happy. The matter is that his momentary powers of accumulation have been raised too fast. He is, according to the Hindu sage, fourth in rank after the master builder. Yet to— (Continued on page 368)



Chemical Equations

which may found NEW INDUSTRIES

THE chemical equation sometimes it is the start of an exploration into new fields at other times it marks the startling climax to a research project - the summary of a chemical conjecture which has been proved by dispassionate and patient trial and test. Many an American industry today owes its prosperity, its expansion or its very existence to the chemical equation, symbolic of research which is constantly seeking to make the best and most profitable use of the common and most available raw materials.

New products, new uses for older products, new ways to make existing products more plentiful and cheaper, more readily available, are the foundations for new industries. The tree was merely a source for wood until research showed that its fibrous structure - cellulose - could be converted into hundreds of useful articles such as transparent wrappings, rayon yarn, plastics, lacquers, photographic film - to name a few. And from coal, salt, sulfur, cotton, vegetable oils - all basic raw materials - have come other hundreds of products. The

importance of such development can be appreciated by the fact that twelve new lines of du Pont products, developed largely since 1929, account for about 40% of the sales. Many of these products either did not exist or were of minor importance before that time. This same condition might well apply to many another American manufacturer.

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PHILOSOPHY AND MODERN ARCHITECTURE

(Concluded from page 368)

of nature which have brought them together. That excellent proportion between supply and demand represents great art and beauty to him. No one could claim that he misapplies the laws of nature, the laws of economics, of cycles, of cause and effect, as is so flagrantly done in this country. The result of this profound love for, and collaboration with, nature brings with it beauty to which we also must ultimately return, since before us are open, I believe, the gates of a new cycle of civilization.

I have drawn what may seem a rather idealized picture, but it is a real one. I have spoken of the peasant to show a way of approach to the solution of the complex problems that are before us in the world today. People are confused; architecture is confused. The sincere effort of Modern architecture is an effort toward order. The architect therefore must seek to deepen his understanding of a world which is neither past, present, nor future, but eternal. He must use all the experience of the past, embodying its principles, not its forms. On the other hand, he must take things as they are — materials, people; must face the present facts.

One must not, however, fancy that the larger aspects of the architect's task will readily be accomplished in full. In one of the Buddha's sermons there is the story about a sage who was curious to know what became of the universe in its state of nonmanifestation. He put this question as he rose from plane to plane, from hierarchy to hierarchy, until at last he stood in the presence of Brahma, the supreme architect of the universe. Brahma was seated on a throne, flanked by heavenly attendants. "Brahma," said the sage, "what happens to the universe in its state of nonmanifestation?" To which Brahma said: "I am Brahma, the Great, the Good, the All-knowing, the Supreme." The sage said: "I did not ask you who you were; I asked you what becomes of the universe in its state of nonmanifestation." Brahma repeated: "I am Brahma, the Great, the Good, the All-Knowing, the Supreme." Three times the sage repeated the same question. The third time Brahma said: "Come over here where the heavenly attendants cannot hear me. The fact is that *I don't know.*"

A TECHNOLOGY OF TRADE

(Continued from page 356)

A strong tendency is to be seen, particularly among industries composed of but a few concerns, to standardize the output of their goods and services within too narrow a range of quality and price. Among regions of the United States alone — which is to say, among states — greater differences than five to one are encountered in average income; and among individual people, greater differences than a hundred to one. A company offering a single output or a line of goods or services narrow in range may be beautifully efficient as a standardized producer, but its (Concluded on page 372)

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The Institute publishes a variety of bulletins, as well as a catalogue of general information essential to the entering student. The Technology Review Bureau will be glad to send, gratis and post free upon request, one or more copies of any publication listed below, or to forward any special inquiry to the proper authority.

Ask for the following pamphlets by their descriptive numbers

1: For general information, admission requirements, subjects of instruction, ask for Bulletin 1.

2: For announcement of courses offered in Summer Session, ask for Bulletin 2.

3: For information on courses in Architecture, both Undergraduate and Graduate, ask for Bulletin 3.

4: For a popular presentation of Educational Opportunities offered at M.I.T., ask for Bulletin 4.

All inquiries sent to the address below will receive prompt attention

THE TECHNOLOGY REVIEW BUREAU

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A TECHNOLOGY OF TRADE

(Concluded from page 370)

selling costs to regions and to people outside a narrow band of incomes will be horribly high. Better more diversity of product to meet diversity of customer.

(11) *Final judgment on future sales or on future production is to be based on trial and not on what people say they want or say they are willing and able to do.*

Expressed desire is one matter; a sale is something else. The censorship of father or mother or the children or the bank account or the buyer's own better judgment must be considered before a contract is signed or money is laid down upon the line. Sales are to be estimated by sales on a small scale after suitable selling effort. A questionnaire is likely to be most misleading. Judgment of a product by what a producer would buy is rarely right.

A man may sincerely believe that he is able by virtue of his training and ambition, to earn his salt. He may convince others of his fitness. And yet all concerned may be quite wrong. The final test of ability must be by results. Regard a taxi driver removed ten paces from his cab. Regard him carefully. Could he be trusted to throw a ton and a half of metal through a city's crowded streets day after day? Would any man in his right mind judge him as competent from anything except results? And yet he drives his cab quite well indeed.

The foregoing are principles, and there are many more. They are not moral principles nor are they immoral. They are not statute laws nor are they illegal. A moral principle says yes or no. A statute law likewise

says yes or no — and mostly no. These principles are technological principles. They are continuous. They state gradation. They supply data. They do not involve belief. They do not depend on authority, they depend on encountered fact; and their truth or falsity depends on trial in service. They do not restrain; they propose, they incite. And those best fitted to deal with technology in trade are they, it may be suggested, who are by practice already familiar with the power and the handling of technological law.

INSTINCTIVE MUSIC

(Continued from page 354)

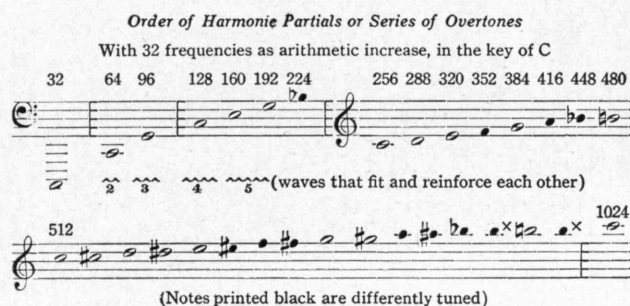


Fig. 1

The order of the intervals is like a résumé of the early evolution of our own music. After the octave and the fifth comes the fourth, a ratio of (Continued on page 374)

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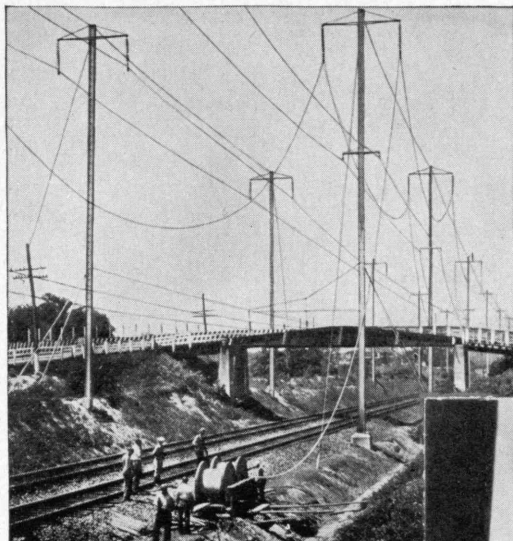
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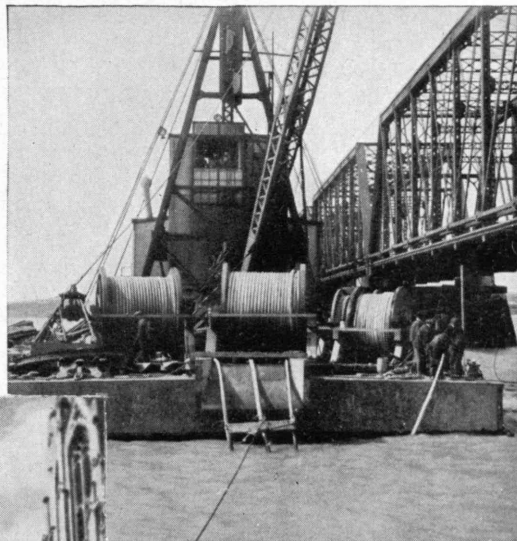
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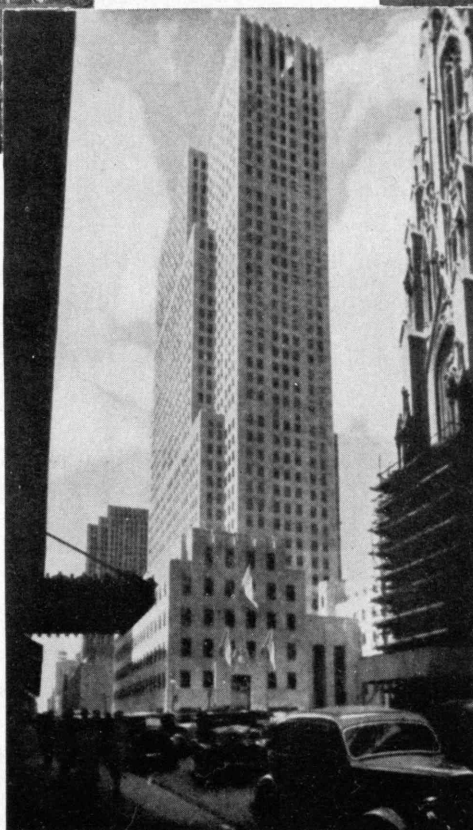
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INSTINCTIVE MUSIC

(Continued from page 372)

4 to 3, and this interval is extremely common in the calls of wild birds. One hears in the raucous cawing of crows the falling fourth (fa-do) almost as a double note. In the third octave of overtones occur the notes of our common chord, do mi sol do', with ratios of 4, 5, 6, and 8. The seventh partial is printed black and it is conspicuous by its absence in our music. Our nearest note to it, si molle, is so differently tuned that we instinctively reject it from the category of basic harmony to which the common chord belongs.

The thrushes have no prejudice against the number seven; three species—the olive-backed, the wood thrush, and the hermit—sing different varieties of arpeggios with ratios of 4, 5, 6, 7, and 8. In other words they tend rather vaguely to divide an octave into four equal arithmetic intervals (see charts on page 354).

Like several other thrushes, the hermit sings a series of varied cadences separated by long pauses of silence, but these phrases are richer and more complex than those of the wood thrush or the olive-backed, often with an effect of successive waves tumbling over each other. Here only a short phrase is recorded, which can give no idea of the bird's range, but it is interesting to compare this fragment with a similar phrase in the song of the wood thrush. Harmonically they are identical, but the rhythm is reversed; the hermit introduces each cadence with a long drawn-out note on a tremolo, then sings his arpeggios so quickly that they are difficult to follow. The tone, as Thoreau describes it, is flashing steel.

In the chart of the song of the wood thrush, the space of a second is reduced by six in order that the musical sequence of the several phrases may be studied. The ratios are those of our common chord plus the seventh partial, arranged or disarranged in various permutations. The change from one note to the next is made decisively without slurring; there is an effect of fine technique in the mere spread of the intervals, as if a violinist's bow, perfectly balanced, were passing in one stroke over all the strings.

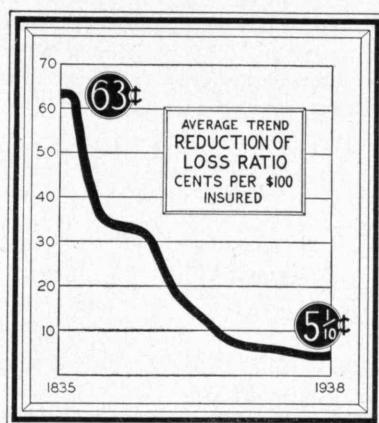
The last note of each phrase is a long drawn-out tremolo with peculiar reverberations, a characteristic of the thrush tone. The noticeable fluttering of the throat does not produce supersonic tones, as has been surmised; on the thrush film the last dim vibrations appear at intervals, carried along on ever so slight separate puffs and buffets of air. The form of the arpeggios is music pure and simple; but the singer hasn't a perfect ear—far from it. The first, second, and last phrases are all fairly in tune and in the same key, assuming a flatted seventh and a tonic of 1,900 frequencies; but the fourth phrase is sharp, the tonic is 2,000. The third phrase is quite irregular. It may be a mere vagary, but the wood thrush actually has a habit of introducing occasionally a distinctly lower note than usual, rather softly with a pretty, muted effect, like a change into a lower and minor key, and so the third phrase of this song may be a variant of this kind.

On the wood-thrush chart one can see how the overtone ratios can be shifted up and down on semilog paper, the spatial distances of the in- *(Continued on page 376)*

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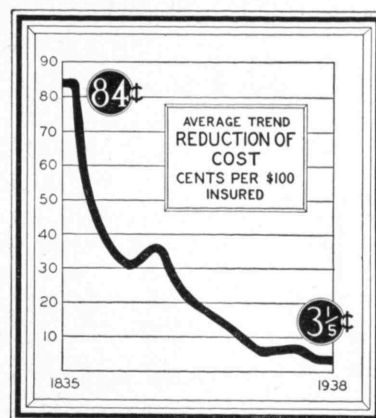
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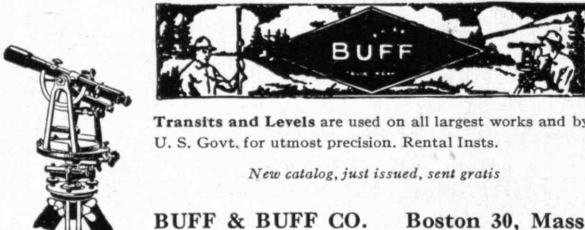
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INSTINCTIVE MUSIC

(Continued from page 374)

tervals remaining the same. According to the theory of instinctive music developed here, it is essential to define the overtones musically as a series spaced and fitted logarithmically by the ear, ready to be shifted freely up and down a logarithmic slide of pitch, owing to the variability of the speed or pitch of the fundamental. It is assumed that any shift of key is felt instinctively throughout the range of the overtones and that related keys are those with mutual overtones.

The first part of the record of the song of the brown thrasher (page 354) is quite unmusical, a fragment of random chatter perhaps; the only interesting notes are the very long slurs at the end. The one which goes both up and down is remarkable because it is an almost perfect example of an arithmetic scale or slide; that is to say, a slide in which the pitch rises by even increases in even time, like the siren of a fire engine. Here it may be a mere accident, but the arithmetic slide is particularly interesting because it provides a natural framework with even timing for the physical scale of overtones.

DO	512	512	512
SI	483.2	480	480
	456.1		448
LA	430.5	426 $\frac{2}{3}$	416
	406.4		
SOL	383.6	384	384
	362		
FA	341.7	341 $\frac{1}{3}$	352
MI	322.5	320	320
	304.4		
RE	287.3	288	288
	271.2		
DO	256	256	256

Fig. 2

As a speculative overtone on the fundamental of musical similarities, compare the natural scale — call it that of the birds — with the two scales that we use in our own music. Fig. 2 shows the frequencies of all three scales plotted on semilog (Continued on page 378)

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INSTINCTIVE MUSIC

(Continued from page 376)

paper. In the middle is the old diatonic: do re mi fa sol la si do'. On the right hand are the fourth and fifth octaves of overtones, consisting of eight and 16 notes respectively, many of them identical with notes of the diatonic. On the left hand is the well-tempered scale which we use in our present system of tuning. Mathematically, the intervals of this scale are very complex geometric fractions, in 12ths, of a geometric series of frequency numbers which doubles with every octave.

When complicated instruments with fixed keyboards, like the clavichord and the harpsichord, were tuned to the old diatonic scale with its seven uneven intervals, the difficulty of making many changes of key was a serious drawback, requiring very large numbers of notes. The fixed keyboard presented a problem which was solved by changing the scale itself. All octaves were divided into the 12 equal geometric fractions which we call semitones, and the old diatonic scale was retuned so that it could be played in 12 different keys to the octave. The number 12 was chosen because it gave the best fit, very good in the lower half of the scale, not so good in the upper half. Freedom of transposition is so essential to music that the well-tempered scale marked a great advance in its day and any displacement of it is unthinkable on account of our musical heritage. However, it is slightly out of tune, because it cannot be exactly fitted in its entirety to the complex shapes and the speeds of synchronizing sound waves. Above all, it is limited and incomplete.

For the human voice, transposition is no problem. Twelve keys to the octave are not a limit fixed by nature; we can sing a tune at any pitch within our range, and a change of key involves no (Concluded on page 380)

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INSTINCTIVE MUSIC

(Concluded from page 378)

mental effort. If, as suggested by these bird charts, there is a universal musical sense corresponding to the physical scale, future musicians may become more interested in the practical possibilities of the series. At present, musical theorists like Sir James Jeans in England and Paul Hindemith in Germany assume that a scale in perfect intonation is an impossibility. They are much concerned with overtones, but they do not plot them logarithmically; consequently they believe that the gulf between pure intonation, on the one hand, and freedom of transposition, on the other, can never be bridged, even theoretically.

One could imagine a futuristic instrument with two logarithmic keyboards, one like the piano with notes equally spaced for the well-tempered scale, the other with narrowing keys tuned arithmetically as a basis for transposing overtone scales, to fit exactly the alignment on semilog paper — the stretch and spacing of all familiar harmonic intervals the same on both keyboards. Or, for still greater freedom and perfect precision, perhaps the problem of transposing the overtone series could be solved mechanically; then we might hear improvisations on a composer's instrument with harmonic possibilities immeasurably greater than those of the piano. Long lines of melody and harmony, climbing freely and branching out like trees, could be developed up and down the whole length of the keyboard.

THE DEADLY GUEST

(Continued from page 358)

book, "Fire," * however, the staircase may be a miserable place for the average person to navigate. Hence other means of escape should be available. For example, every bedroom on the second floor and above should have a means of emergency egress. At least one window should open widely enough to permit a person successfully to climb out, and, if possible, this window should be located at a point where a roof below will lessen the height of the drop or where there is a flower bed to ease the force of the fall. Most double-hung windows, even when opened to their widest extent, are difficult to pass through and do not allow control of the nature of descent. A casement window has much to recommend it as an emergency fire exit and can be easily installed in place of the more conventional type. Since it is hinged on the side, the full window-frame opening can be made available. Too often one finds, par- (Continued on page 381)

* Dougherty, Thomas F., and Kearney, Paul W., "Fire." G. P. Putnam's Sons, 1931.

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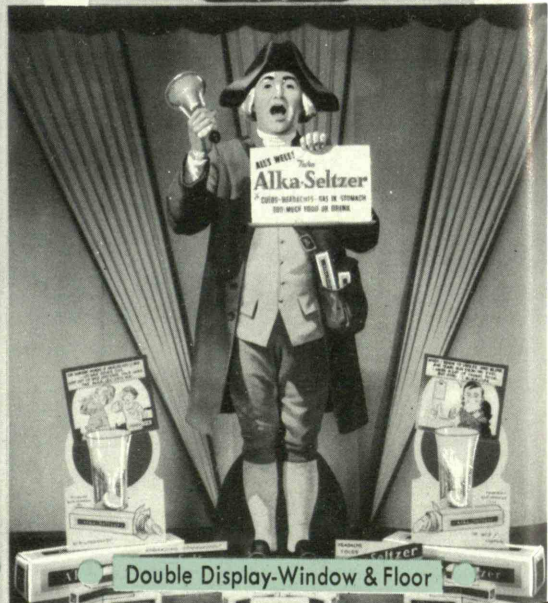
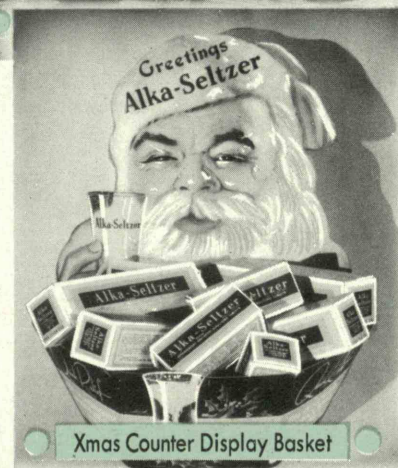
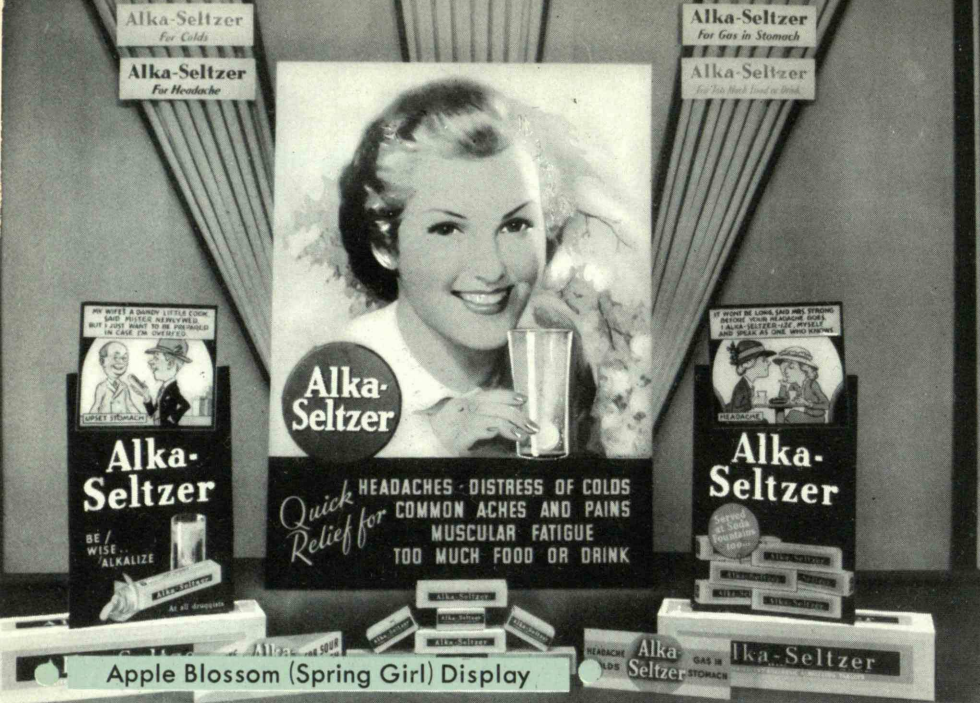
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THE DEADLY GUEST

(Continued from page 380)

ticularly in a third-floor bedroom, small double-hung windows which automatically seal the doom of an occupant trapped by fire. In recently developed casement windows where metal window frames are used, the section which can be opened is often entirely too small for a person to pass through. Even with the glass knocked out, the framework would act as a successful barrier to egress.

A window balcony, preferably of substantial construction and bounded by an iron rail, provides an excellent emergency location for the house occupant while he awaits the arrival of outside help. These balconies can be made most attractive, to form a successful symmetry with the house design. Even a small iron-ladder fire escape is worthy of serious consideration. Miniature fire escapes of this sort for the private home can be so skillfully designed as to be unnoticeable to the visitor and, used in conjunction with vines, can provide an attractive addition to the general appearance of the house. Here is an opportunity to safeguard with slight structural change the inhabitants of older houses.

Even though we provide an automatic means of ventilation and even though we give the householder a way out other than the central staircase, thus taking care of two of the three factors which I have mentioned, one vital danger remains to be eliminated. Fire does not always give adequate warning of its presence, and without this warning the preceding expedients may be useless. Even a normal, healthy individual, whose sleep is unassisted by liquor or sedatives, may never wake up if certain conditions of heat and smoke, not to mention gases, prevail in his bedroom. This fact brings up the most important need in home design in relation to fire hazard: a home fire-detecting alarm system which can be easily installed in any type of building.

Not long ago, to test the availability of fire-alarm information to the public, I visited a permanent architectural exhibit in New York City, where there are several floors devoted to the display of almost every kind of material and gadget known to the builder's art. I went to the information bureau and asked where I could see the exhibit of home fire-alarm appliances. The clerk looked surprised. After consultation with several assistants, he declared that there was no such exhibit but that if I was really interested he could give me two or three pamphlets issued by manufacturers specializing in these appliances. He felt sure that they would be glad to take the matter up with me.

Even fire chiefs, who, of course, know about home fire-alarm systems, do not have up-to-date information on them readily available. I am sure that if an interested home owner inquired of some fire chief as to the actual means of obtaining the right system for his home, the fire officer's surprise at the question would prove its rarity. There are available for the home, however, several fire-detecting systems which are excellent, easy to install, and not expensive, and which would have entirely prevented the tragedy described at the beginning of this article. These systems run all the way from a small individual mechanical unit to an arrangement which covers all the house. (Concluded on page 382)

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THE DEADLY GUEST

(Concluded from page 381)

Probably the most complete protection is afforded by a system based on the fact that air expands when heated. The operation of this system results from the rate of temperature rise rather than from the attainment of a dangerously high temperature.

Another system which has much merit is that of placing at properly determined points thermostatic heads which will close a contact when actuated by a certain degree of heat and will sound an alarm. Caution should be used in basing the action of an alarm system entirely on the household electric current. Fire often originates from some misuse of household current, and this might at the same time eliminate the use of the current for actuating an alarm. A battery system, periodically and carefully inspected, is preferable.

An excellent fire safeguard, long successfully used in large mercantile establishments, is a combined sprinkler system and alarm. The use of this system is particularly commendable in older types of houses where the cellar arrangement, including the heating apparatus, location and type of stairway, and collection of miscellaneous combustible material, provides so great a fire hazard that cellar fires in private homes account for one of the largest percentages assigned to the various locations of fire. Manufacturers have developed for home cellars a simple sprinkler system which is easily installed and which can be connected to the regular water supply. These sprinkler systems when combined with an alarm serve a threefold purpose in that they give the householders adequate warning of the start of a fire, are efficient in preventing its spread, and help to extinguish it.

Many individual units are available, both wind-up mechanisms released by the melting of a fusible link, and ingenious devices designed to be inserted in electric-light sockets at strategic locations. All have merit, and the selection of one type over another depends a great deal on the amount of money available for such expenditure and the amount of coverage desired in the fire-detecting system.

The average citizen's apathy toward the prevention of home fires and the protection of life against them is most distressing to those who, through training and experience, are aware of these hazards. The educative work of fire department officials is, unfortunately, often discounted as an overemphasis on the nature of their calling. Architects and engineers have a great responsibility in guiding the public toward properly protecting their lives from fire.

MAIL RETURNS

(Concluded from page 336)

knowledge they are acquiring at Technology to aid their country in peacetime to do all possible injury to our industry and commerce, and in wartime to kill as many as possible of our sailors and soldiers. Why should Technology assist such students to achieve their patriotic aims?

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ANALYSIS of 537 JOBS,
NOVEMBER, 1938 – APRIL, 1939

Engineering and Technical Positions—325 Jobs

Scientific

Research.....	15
Analytical.....	28

Engineering

Teaching

Experienced.....	123	Administration.....	2
Research.....	26	Professors.....	2
Recent Graduates.....	103	Instructors.....	26

The Remaining 212 Openings Follow:—

General Executive.....	13	Power Plant Operation.....	3
Financial.....	3	Plant Engineering.....	19
Sales.....	71	Construction.....	13
Production.....	31	Miscellaneous 5 of 2 each.....	10
Production Control.....	32	Miscellaneous 13 of 1 each.....	13
Advertising.....	4		

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TECHNOLOGY MEN IN ACTION

CHECK LIST OF THE ACTIVITIES AND ACHIEVEMENTS OF M.I.T. ALUMNI, OFFICERS, AND STUDENTS

In the News

☐ RUSSELL W. PORTER '96, for his work on the 200-inch telescope. RALPH J. BATCHELDER '08 has collaborated with Mr. Porter on this observatory for Mount Palomar.

☐ ROGER W. BABSON '98, for saying: "If I were a young man, I would come down here in the South to seek my fortune."

☐ FRANK B. JEWETT '03, for election to the presidency of the National Academy of Sciences.

☐ GEORGE B. FARNHAM '04, for having watched and aided the telephone industry for more than 30 years.

☐ ERNEST H. HUNTRESS '20, for his appointment as chairman of the committee on film preservation of the division of chemistry and technology, National Research Council.

☐ C. HUESMANN DUCOTE '23, for hoping that oil will ease the load borne by sugar, since he believes the "price of sugar is the 'economic dictator' of Cuba."

☐ LOUIS J. O'MALLEY '28, for being admitted to the bar with his wife, the first time in Massachusetts that a man and wife have been made lawyers at the same time.

☐ LAWRENCE P. ABARE '30, for directing the laboratory maintained by the First National Stores to insure quality and purity in their goods.

☐ SAMUEL B. ZISMAN '30, for designing one of the 50 books judged best in 1939: "College Algebra," by Edwin R. Smith, published by the Cordon Company, Inc., New York City.

☐ WARREN J. MEAD, Staff, for election to membership in the National Academy of Sciences.

☐ C.-G. A. ROSSBY, Staff, for election to honorary membership in the Royal Meteorological Society of London "in recognition of eminent services rendered to meteorological science."

Spoke Before . . .

☐ Sigma Xi chapters, ten of them, on aeronautics, JEROME C. HUNSAKER '12, one of four lecturers touring the country to speak on this subject.

☐ The Midwest Power Conference, on the problem of reducing air pollution by power plants, ROBERT V. KLEINSCHMIDT '18.

☐ Queen's University, three times, on the mineral deposits of the Zeballos area, British Columbia, and the Malartic area, Quebec, HENRY C. GUNNING '26.

☐ The Quincy High School, Quincy, Mass., under the auspices of the Society of American Shipbuilders and Designers, on welding procedure, ALDEN E. TOWER '35.

☐ An Indian audience in Jamshedpur, the second annual Perin Memorial Lecture, on the latest advances in metallurgy, GEORGE B. WATERHOUSE, Staff.

Written

☐ By SANFORD E. THOMPSON '88, an article, "Optimum Productivity in the Workshop," in the *Journal* of the Society for the Advancement of Management. In *Nation's Business* for January, Mr. Thompson collaborated with William E. Curley, Vice-President of the Thompson and Lichtner Company, Inc., on an article, "System Can Cut Building Costs." His paper, "Standards in Their Relation to Production Control," presented before the Technical Association of the Pulp and Paper Industry is to be printed in the 1939 issue of "Technical Papers."

☐ By HORATIO W. LAMSON '15, an article, "A New Null Detector for A-C Impedance Bridges," *The General Radio Experimenter*, April. This same issue carries "A Low-Distortion Oscillator" by HERMON H. SCOTT '30.

☐ By PHYLLIS KRAFFT NEWILL '22, a book, "Good Food and How to Cook It," Appleton-Century, New York City.

☐ By EDWARD R. SCHWARZ '23, an article, "Technical Evaluation of Textile Finishing Treatments," *Textile Research*, April. In the same issue is an article, "Properties of Gelatins and Glues and Their Relation to Warp Sizing," by WILLIAM E. YELLAND '30.

☐ By SAMUEL G. ESKIN '26, an article, "Effect of Contact-opening Speed on Arc Energy in A-c Switching," *General Electric Review*, February.

☐ By ROBERT W. CLYNE '30, a book, "Engineering Opportunities," Appleton-Century, New York City.

☐ By ERNST A. HAUSER, Staff, a book, "Colloidal Phenomena," McGraw-Hill, New York City.

DEATHS

* Mentioned in class notes.

☐ FRANCIS H. APPLETON '71, April 5. Of him the *Boston Evening Transcript* said (April 7): "A member of one of Boston's oldest and most distinguished families, a manufacturer, a military man, a dabbler in politics, associated with scores of fraternal, charitable, and semi-public organizations, General Appleton might have been remembered as merely another stout heart in the tradition of 'The Late George Apley.' But his story is only half told at that point. . . ."

"In delicate health while attending Harvard, he decided that the outdoor life of farming was the thing to put him back on his feet. . . . He took graduate work at M.I.T. and returned to Harvard when the Bussey Institute was founded. . . . He plowed his own fields, milked his own cows, chopped his own wood, and herded his own prize stock at the local fairs. . . ."

☐ GEORGE T. FRANCIS '80, January 15.

☐ JOHN P. WALWORTH '84, April 19.

☐ WILLIAM H. CHADBOURN '86, April 16.*

☐ FREDERIC MASON '86, April 25.

☐ ALBERT G. DAVIS '93, April 25.*

☐ FRANKLIN M. KELLOGG '98, January 7.

☐ ALLSTON SARGENT '98, April 16.

☐ WILLIAM E. WEST '99, March.*

☐ ROBERT J. MONTGOMERY '01, April 7.*

☐ EDWARD BURNHAM, JR., '02, August.*

☐ JAMES A. PITTS '05, February 13.*

☐ DONALD A. STEWART '06, March 29.*

☐ HENRY B. ALVORD '07, April 20.*

☐ JAMES F. JOHNSON '11, April 27.

☐ BANCROFT WINSOR '12, April 8.*

☐ FRANCIS P. O'HARA '17, April.

☐ VERNON B. LANDEL '28, April 8.

☐ HARLAN HUBBARD '36, April 16.*

☐ HENRY H. FAY, Former Staff, April 24. Born in Pennsylvania, Professor Fay was a graduate of Lafayette College in 1889 and received his Ph.D. from Johns Hopkins in 1895. From that year until he retired in 1925 he taught in the Institute's Chemistry Department. Professor Fay leaves only a daughter, Mrs. James H. Sachs of Bedford, N.Y., Mrs. Fay having died in 1936.

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

M.I.T. Association of Buffalo

On Thursday, April 20, approximately 80 people gathered at the new Chevrolet Motor and Axle plant, and, in groups of ten, the men made tours of the plant. The members were shown how the raw material was received, inspected, machined, and assembled to make the finished motor or front or rear axle, and after the final inspection how the motors and axles were shipped out to the various assembly plants. Dinner was served in the plant cafeteria. At the short business meeting, John F. Strickler, Jr., '32, was elected vice-president of the Club to succeed John Ryan '35, who has left the Buffalo area.

The group assembled in the conference room of the Chevrolet main office building to hear a talk on "Quality Automotive Production" by C. W. Jackman, Chevrolet's resident engineer. A fine talk was given on precision methods of making the modern automobile. To conclude the meeting, several sound moving pictures on subjects related to the automobile industry were shown. This was a record turn-out of members and, judging by the comments made, a fine time was had by all. — JOHN D. RUMSEY '33, *Secretary*, 245 Elmwood Avenue, Buffalo, N. Y.

M.I.T. Club of East Tennessee

The annual meeting and dinner of the Club was held at O'Neil's Café, Knoxville, on the evening of March 31. Our guest and speaker was R. E. Dunford of the University of Tennessee, who spoke informally on "The Application of Psychology to Business." Dr. Dunford is an unusually fine speaker, and his subject was very appropriate and interesting. Theodore B. Parker '11 made a few remarks regarding possible national defense angles of the Tennessee Valley program. The meeting was presided over by Joseph C. Nowell, Jr., '23, President, and reports were made by the Treasurer, George Slover '21, and the Secretary, Albert S. Peet '09. The following new officers were then elected to serve for the year 1939: President, Dana M. Wood '06; Vice-President, Andrew T. Regan '33; Treasurer, Howard P. Emerson '28; and Member of Executive Committee, Emil S. Birkenwald '23.

The following members were present at the meeting: Joseph H. Kimball '94, Arthur R. Holbrook '04, Dana M. Wood '06, Bernard R. Fuller '09, Albert S. Peet '09, Phifer Smith '09, Theodore B. Parker '11, P. P. Pizzorno '16, Erwin Harsch '20, Morris M. Bauer '21, George Slover '21, G. Everett Farmer '22, Emil S. Birkenwald '23, Robert B. George '23, Vancouver M. Hare, Jr., '23, Joseph C. Nowell, Jr.,

'23, Walter K. Johnson '27, Robert E. Crawford '28, Howard P. Emerson '28, George P. Palo '28, Andrew T. Regan '33, Raymond W. Smith '33, Joel B. Stevens, Jr., '33, Albert G. Kern, Jr., '34, and Richard E. Hickman '36. — ALBERT S. PEET '09, *Secretary*, Knoxville Glove Company, P.O. Box 138, Knoxville, Tenn.

Technology Club of South Florida

With spring in the air, jasmine in bloom, and Bill and his brethren (pelicans to you) practicing their echelons and Vee of Vees, what more appropriate season could have been chosen for another meeting of the Club? So on April 12 at 7:00 P.M. a symposium of 19 resident engineers and their guests got under way at the Seven Seas Restaurant in Miami. With B. Howard Brown '30, President, conducting, the club business was disposed of with the usual éclat. At the risk of a Congressional investigation, Secretary Thayer '23 announced a treasury surplus of \$14.78, a stupendous total — shades of the "moribundant life."

At the conclusion of dinner, J. H. Clouse of the department of physics at the University of Miami, the guest speaker, spoke on mathematics and physics. In a splendid address, Professor Clouse discussed the philosophical aspects of these subjects and their importance to the world in general and to the high school and college student in particular. A lively discussion followed. The meeting then adjourned, with homeward-bound members discussing the integral, differential, and hyperbolic cosine, in clusters on Flagler Street. — CLARENCE P. THAYER '23, *Secretary*, 1760 Northwest 41st Street, Miami, Fla. JOHN F. AUSTIN '38, *Reporting Committee*, Switzer Marine Electric Company, 19 Southwest Sixth Street, Miami, Fla.

Technology Club of Milwaukee

Our last meeting was held on Saturday, April 22, with the following members attending: J. F. H. Douglas '05, Edwin L. Smith '05, O. D. Colvin '24, Erling S. Mathiesen '29, Bruno H. Werra '32, Leon J. D. Healy '09, Harry H. Valiquet '03, Lemuel D. Smith '06, and Robert M. Osborn '36. After lunch at the Pfister Hotel, the following officers were elected for the coming year: Erling S. Mathiesen, President; Daniel J. O'Connor, Jr., '37, Vice-President; and Robert M. Osborn, Secretary. It is worthy of note that of the nominating committee of three, the names of two appear among the new officers. Someone was heard to mutter something under his breath about smoke-filled rooms. The Club expressed its appreciation to the retiring President, L. D. Smith '06, for his splendid work while in office.

The program for the afternoon consisted of an inspection tour through Milwaukee's activated-sludge sewage-disposal plant. — It is hoped that we will be able to arrange a party in the late spring or early summer at some near-by lake. If so we will probably arrange it at such time that some of the undergraduates and '39 graduates will be able to attend. — ROBERT M. OSBORN '36, *Secretary*, 2840 West Highland Boulevard, Milwaukee, Wis.

M.I.T. Club of Northern New Jersey

The Stein Song rang down the curtain Thursday night, April 20, on the last official act of the present season. The annual banquet at the Newark Athletic Club was attended by 175 enthusiastic Alumni, including 12 visiting Clarkson men (Clarkson College of Technology, Pottersdam, N.Y.). The dinner was preceded by a reception to Dr. Compton and guests in the new M.I.T. room at the Athletic Club.

After a gratifying meal President Clarke '21 introduced the "visiting firemen," including the guest of honor, Henry D. Hibbard '77, III, of Plainfield, the senior Alumnus of northern New Jersey. Those seated at the speakers' table were next introduced with brief comments on the year's activities of the officers and committees. (Note: Withal there are no dues, the Club is gratifyingly solvent.)

Past President Vilett '22 read the report of the nominating committee on officers for next year, and the nominees were elected by unanimous vote. The names of the officers will be given in the next issue of The Review. Charlie Roche '23, song leader, led three M.I.T.'s for retiring President Clarke. Raymond Haskell '03, toastmaster, then took the reins and presented the speakers, with his usual poise and a fund of stories.

Frank Jewett '03, incoming President of the Alumni Association, pledged his support of alumni activity. — James S. Thomas, President of Clarkson College of Technology, was unable to attend. He was ably represented by John A. Ross, Jr., '01, dean, who recounted how M.I.T. had fathered Clarkson and how Clarkson, by virtue of the honorary degree bestowed upon Dr. Compton, could now proudly point to a Clarkson man as president of our alma mater. An intriguing innovation was "Noises of the Institute" — a phonographic reproduction of Technology sounds — from a dormitory yell to a stirring rod clinking in a beaker. This was produced especially for the occasion and presented by Richard H. Ranger '11. — Allan R. Cullimore '07, President of Newark College of Engineering, spoke inspiringly about "What Is

Old at M.I.T." He extolled an "honest and uncompromising integrity toward his science and profession" as the legacy of the Technology of '77 and '07 to the new Technology with its new problems and new accomplishments.

President Compton, traditional honor guest at the annual banquet, told us "What Is New at Tech." He used a series of new slides to show the many things which have happened and are happening at the Institute. From new athletic field to cyclotron and from Rogers to differential analyzer, the talk impressed everyone with the strides that are being taken to keep the Institute in the forefront of scientific and engineering research and education. As one oldster remarked: "Born many years too soon." — CLAYTON D. GROVER '22, *Secretary*, Whitehead Metal Products Company, Inc., 303 West Tenth Street, New York, N.Y. FREEMAN B. HUDSON '34, *Assistant Secretary*, Colgate-Palmolive-Peet Company, 105 Hudson Street, Jersey City, N.J.

M.I.T. Club of Toledo

On March 22 a group of 25 Alumni and guests sat down to dinner with President Compton at the Women's Club in Toledo. We were pleased to have as our guest also Philip C. Nash, President of the University of Toledo, who courteously entertained Dr. Compton during his overnight stay. Dr. Compton's talk on Technology and its various activities and plans for future activities was most enthusiastically received.

Raymond C. Reese '20 presided, and after the talk questions from the Alumni developed an interesting general discussion. Alumni present at the meeting were: Herbert A. Barnby '23, William J. Bates '35, Stanley H. Davis '13, William F. Donovan, Jr., '24, Glenn E. Fargo '21, Archibald Gardner '02, Henry Grinsfelder '31, Isaac Hausman '11, John P. Hayes '36, Benjamin E. Hopkins '20, Eugene J. Lourie '31, Garland Lufkin '18, John D. Northrup '34, Howard G. Pankratz '29, Raymond C. Reese '20, Arthur R. Smith, Jr., '28, Harold F. Stose '21, Waynard R. Vosper '26, Elwood A. Windham '23, Charlton P. Whittier '27. — CHARLTON P. WHITTIER '27, *Secretary*, Owens-Illinois Glass Company, Toledo, Ohio.

Washington Society of the M.I.T.

The Society celebrated its annual dinner and ladies' night on Monday, April 17, at the Brook Farm Tea House in Chevy Chase, Md., cocktails being served at 7:15 P.M. Following the reception and then the excellent dinner, Proctor L. Dougherty '97 asked for the floor as usual, and read a letter from President Compton expressing his regret at his inability to be present. He then introduced Frank E. Richardson '16 who is in Washington coordinating Army and Navy air forces; Harry L. Grant '00; William S. Tyler, 3d, '29, and Margaret Yard, custodian of the Shakespearean Folger Library; Edward P. Warner '17, former Assistant Secretary of the Navy, and technical advisor to the

Civil Aeronautics Authority. (Warner's elevation to membership in the authority itself was announced the following morning.) Others introduced were: Currier Lang '04 of Norwalk, Conn.; Mr. and Mrs. Parker Dodge '07 and '16, examples of benefits of coeducation at M.I.T.; Edwin W. James '07, President, and Vice-President Merrill '09, President of the Capital Transit Company, who had been pinch-hitting for President James in his absence. Dougherty pronounced him just as good as the President. Albert E. Beitzell led the Stein Song, accompanied by Mrs. Beitzell as pianist. Amasa M. Holcombe '04 then led an M.I.T. cheer for President James. The latter expressed his happiness at being able to be here since his return from earthquakes in Chile and a revolution in Peru. He announced his extraordinary success as president in keeping up attendance, and he felt that he was responsible for the excellent record because of the fact that he went away, thus producing the record. James said that following him we would hear from an eminent orator and an eminent scientist, each of whom wanted the other to give the first speech, and the first of whom would discuss what the second man was going to say. He then introduced Vannevar Bush '16, President of the Carnegie Institution and a former Vice-President of the Institute.

Dr. Bush talked on gadgets and gadgeteers, stating that they dated from Thomas Jefferson and Benjamin Franklin. He described the telephone as one of the gadgets now fully developed. "For a long time," he said, "we all thought that complexity and reliability could hardly be compatible, but we now see that this is no longer true." For examples he sighted the automatic telephone, the automatic substation on the railroad line (inspected only once a month), the large automatic switch in the power station that waits for months to act instantly in case of a fault in the line. "Nowadays," he said, "we have scientists who can develop a gadget for any given purpose possibly within as little time as one-half hour." If he wanted a device such as a photocell to detect a woman in a blue dress coming through a doorway, this could be produced. Further, it could then light a blue light; next, it could turn on a green light if any man over six feet tall came in; and third, a series could be set up so that it might do any number of things when the woman in the blue dress was followed directly by the man over six feet. Among men who have done much in the way of gadgets, he cited Hannibal Ford, whose computing devices for large guns have put our Navy well ahead in effectiveness. He looks forward, he said, to the days of automatic operation of automobiles. We need more gadgets. He wants one so that he can turn on a switch, step on the accelerator, and go off in his auto, instead of having to perform about 18 different operations as at present. Another gadget mentioned was for operating airplanes in fog. Any airplane could land on a field where three lights are visible. While this is impossible under certain fog

conditions, these lights can be represented by spots in the plane itself, operated and controlled partly by radio and partly by gyrocompass, so that the plane can be set down and the operator can see what he is doing from a diagram in the plane itself.

Following the eminent scientist, we heard from the eminent orator, Honorable Robert Lincoln O'Brien, former President of the United States Tariff Commission. Mr. O'Brien's talk was a pleasure, with story upon story amusing his audience. Citing the superiority of Tech men, he told of the salesman who said that it was impossible to sell his daily-dozen machines to any M.I.T. man. In explanation, the salesman said that no Tech man needs any exercise. He gets all he needs in the morning by arising and shaking hands with himself. The serious portion of O'Brien's talk centered on our form of government, particularly the growth in power of the presidential office. Together with this growth, he said, we have a system of selection that more closely approximates a lottery than any other device. Among the curious incidents in electing a president, he mentioned the notification of Pierce in 1852, eight years after the telegraph. An old man, Mace, who worked for Pierce, returning from the telegraph office where he was keeping posted on the convention in Baltimore, was seriously jolted when he learned that Pierce had unexpectedly been nominated. Returning to General Pierce, he said: "General Pierce, they have nominated you, ridiculous as it appears!" As early as 1898, he quoted Henry Cabot Lodge as against giving presidents the power to veto specific items of any appropriation bill, stating at that time that we were building up the presidential office too much. He cited how Cleveland was powerless to get his tariff bill through, but how Lincoln was able to force the South with the power of his presidential office. Besides curious stories of Coolidge's wisdom in being able to "pick 'em young and tell them nothing," he cited how obscure this president really was before his rise to power. Although Coolidge had been in the Massachusetts House of Representatives for three years, Tinkham did not know him when he was running for the Senate. Another example of a startling nomination was the case of Cleveland, an ex-sheriff, practicing law over a hardware store and sleeping on the third floor. O'Brien decidedly is for changes in our system of selection, favoring more of the career method, also favoring lessening presidential powers.

During the course of the evening, our Honorary Secretary, Henry D. Randall, Jr., '31, announced that the following would serve with him on the scholarship committee: Joseph Y. Houghton '26, Oliver G. Green '30, and William K. MacMahon '22. Any members interested in candidates for scholarship should get in touch with the committee promptly.

This ladies' night, continuing the quality of the past season's meetings, gave further evidence of the stimulated interest of Technology men around Washington. The following members and guests en-

Plan to attend Alumni Day, June 5

joyed the evening: George W. Stone '89 and Mrs. Stone, Judson C. Dickerman '95, Joseph W. Clary '96 and Mrs. Clary, Proctor L. Dougherty '97 and Mrs. Dougherty, Charles H. Godbold '98, Lyman F. Hewins '98 and Mrs. Hewins, W. Malcolm Corse '99 and Mrs. Corse, Harry L. Grant '00 and Mrs. Grant, Allen B. McDaniel '01, W. Lorrain Cook '03, Merton L. Emerson '04, Amasa M. Holcombe '04, Miss Holcombe, and Mr. and Mrs. Varner, guests, Currier Lang '04 and Mrs. Lang, Frank W. Milliken '04 and Mrs. Milliken, George N. Wheat '04 and Mrs. Wheat, John C. Damon '05 and Mrs. Damon, Parker V. Dodge '07 and Mrs. Dodge '16, Louis H. Tripp '06, Frank E. Richardson '16, Edwin W. James '07 and Mrs. James, Edward D. Merrill '09 and Mrs. Merrill, Joseph C. Dort '09 and Mrs. Dort, Ernest L. Patch '10 and Mrs. Patch, C. Phillips Kerr '11 and Mrs. Kerr, Emery L. Lasier '12, Mrs. Lasier, and guest, Charles C. Gager '17 and Mrs. Gager, Pierre Blouke '19, George W. Anderson '20 and Mrs. Anderson, Kenneth Bernard '22, William K. MacMahon '22 and Mrs. MacMahon, Karl E. Schoenherr '22, Paul J. Culhane '23 and Mrs. Culhane, Ralph Ilsley '25 and Mrs. Ilsley, Joseph Y. Houghton '26 and Mrs. Houghton, Albert E. Beitzell '28 and Mrs. Beitzell, John A. Plugge '29 and Mrs. Plugge, William S. Tyler '29 and Mrs. Tyler, James G. Bowen '30, Frederick W. Turnbull '30 and Mrs. Turnbull, Oliver G. Green '30 and Mrs. Green, Albert F. Bird '30 and Mrs. Bird, Henry D. Randall, Jr., '31, and Mrs. Randall, Freeman G. Corkum '31 and Mrs. Corkum, Marshall M. Holcombe '36, and Mr. White.—ALFRED E. HANSON '14, *Secretary*, 3424 Quebec Street, Northwest, Washington, D.C. WILLIAM K. MACMAHON, *Review Secretary*, 818 25th Street, South, Arlington, Va.

CLASS NOTES

1877

Here is Francis H. Bacon's diary at last, printed practically as he presented it to us: "April 26: Leaving Chanakkale. After a grand rush of packing, collecting all the unanswered letters, and so on, Godfrey came with a car saying: 'Hurry up, steamer is near the pier.' Great rush to get away, Alice and Edith waving good-by. It was the old *Mersine* all painted up. Ship fortunately not crowded as usual. Good clean cabin all to myself. Sea quiet, and I lie down and wonder if this is really me, escaped at last from the Turkish prison, for outsiders don't realize that no foreigner living in Chanak is allowed to go outside the town limits. Military zone now. No more walks into the country, picnics or bicycle rides for the younger members. Can't even go to Troy. Might see something! I hated to leave Alice but a recently arrived package of garden and flower seeds from Burpee will help console. . . .

"April 27: Arrive early off San Stefano; watch mosque of Ahmed and minarets of St. Sophia glide by the porthole; around

the point to Sirkeji by 7:00 A.M. Jacob from the hotel there to greet me; through the customs, no trouble about baggage; rattle in a taxi, over the bridge and up the hill to Hotel Londres by eight o'clock. Welcome from Dandria! Lambro and Cozza, the good Armenian porters, at the desk; Emilio, the waiter, has my usual table ready for breakfast. Millington, war-graves superintendent from Chanak, also there. In the lobby a young man spoke to me. It was a young Oxford student, Mr. Foot, whom Mr. Lee had told to speak to me. He was leaving next morning for Chanak and Troy; invited him to lunch and will send letter by him. Lee who had been in Stambul went back to Chanak last night — we must have passed each other in the Marmara. Went to Dr. Barry who fixed a bad tooth and made my 'set' more comfortable. Called at German Institute; saw Fräulein Dorn, the nice little lady, now librarian, who had tea with us in Chanak when she went to Troy. Got the address of Dr. Bittel who is taking a cure in Germany for malaria. Heard all about the various German digs. Taxi to American consulate to fix up passport for Greece. Meet the consul, Latimer, a fine young chap, classmate at Yale of my nephew Kenly, my brother Carl's son. Must get Greek visa. Taxi to Greek consulate; they charge 8.40 lts for visa — 'ouch!' An Englishman only pays a shilling or so. Cable to Fritz 'going to Athens.' Call on Betty Carp at the United States Embassy, arrange for lunch together. Back to hotel to meet young Foot — interesting chat. He left Winchester public school having won an Oxford scholarship and proposed to travel until time to enter; was going to Greece and bicycle up through Italy. While at lunch Theron Damon arrived with warm greetings from all at Hissar. He wanted to cart me right out to stay with them and the Huntingtons. Couldn't possibly; too many errands in town. Afterward up in my room Theron and I have heart to heart talk recalling old days when we prowled about Stambul and Scutari together looking up the work of Sinan, our visit to the Sultan's old galleys; our trip to Rhodes together in 1931, and of course the War, when he carried the embassy bag up to Berlin. Had typhoid in hospital there. Alice and Edith refugees in Constantinople; Laura in New York; I in Boston. Plenty things happened during those years.

"April 28: Theron arrives early for our last day together. Take taxi to museum to see if anything is added to the garden where I used to photograph and measure things from Priene, Miletus, and so on. All the same — nothing added — only they have cut away all the ivy from the wall. Instead of going back to the hotel for lunch, decide to go to the open-air Turkish restaurant back of the Bayazid Mosque. A party sitting at one of the tables waved to us to join them. One was MacDowell Russell, the British Bible agent, with a young Professor Adams and wife from Hissar. I saw Russell last in 1931 at Rhodes, where he was selling English Bibles in the Dodecanese; he

reminded me of George Borrow in Spain, especially one morning at breakfast when he related his adventures: was postmaster in Smyrna in 1922; imprisoned by the Turks, escaped, went to China and other places. But let's get back to our lunch: broiled swordfish on spit, with spinach and other vegetables. While at table Turkish funeral passes close to us coming out of the mosque near by, the coffin borne on men's shoulders, friends walking slowly after with bowed bare heads; coffin was draped with an embroidered cloth, so they said it was a woman. Mostly Turkish officers sitting at the tables; a big Frigidaire at back showed they were up to date, and taxis waiting in the square showed that the old Turkey had passed. Beckon to a taxi, and Theron and I go up past the Suleimanie, down the back street by the 'Evkaf' to the Tomb of Sinan to inspect the changes since our last visit, as the authorities had cleaned it up, regilded the inscription, and made other changes. I don't know on what authority but they had closed up the door to what I thought had been the chapel, and a new door cut farther down below the level of the garden above. The sarcophagus with the big Janissary turban under the stone canopy had all been cleaned and was covered with wreaths, for they recently had a big celebration, orators and speeches for the birthday of the great Turkish architect, Sinan, who was really a Greek (see my memoir on Sinan) — much as your life is worth to even hint at this. Take photo of Theron standing next the fountain. Back to hotel where I find Miss Haspels waiting to see me. She was leaving soon for her dig at the tomb of Midas. We sat in the lounge, when a very trig, precise-looking English lady came in, and I was introduced to Miss Garrod, friend of Winifred Lamb, just leaving on an archeological tour in Anatolia with a couple of husky young men in tow from Harvard, armed with typewriters and notebooks. When I asked what was her speciality, she said the 'Stone Age.' Can't get further back than that, so she beats the Hittites and Sumerians, and I suppose the world will now be filled up with more stuff of little interest to F.H.B. Life is too short. Leave tomorrow by Italian boat for Piraeus.

"April 29: Down to Galata Quai with Jacob; show passport. How much money have you? Baggage passed, not opened; up gangplank into the foyer of nice clean steamer *Foscari*, quite another world than the Turkish Sefaine. Spruce maître d'hôtel and officers settling people, giving out cabins, and so on. They all seemed so full of life and spirit, a different world from somber Chanak! Betty Carp came to see some friends off; asked her to write Alice and tell her how comfortable I was. Off at ten o'clock, and I settle down and watch the passengers; hard to realize I am really off. Meet an interesting man, Daniel Wright, member Carnegie Foundation for International Health, now stationed at Ankara; has to travel all over Turkey; has lived everywhere. Engineer in South America on head water of Amazon; was in Panama Zone in 1904; knew

1877 *Continued*

my friend Bertram Goodhue, the architect, when he came to Colon to build the government hotel. Was living in Athens and knew Venizelos; was in Crete with him when the rebels ran away with the battleship *Averoff* in that revolution which ended in smoke. Knew Rosalind Reed in Smyrna and had been at their house, but I must get back to my chronicle! Fine lunch at noon. Four at table: myself, Mr. Wright, a clean-cut young Englishman in 'Austin Reed' clothes going to Alexandria for the Ford Company, a swarthy Indian from the Punjab, professor of history in Calcutta University — spoke perfect English. Near by, at another table, an American government official from Seattle and a Finnish sculptor and wife from Helsingfors who spoke German, going to Athens for a first visit; was able to help them with suggestions. Got out my Herodotus, gave it to the young Englishman to read up about the bridge of boats and the mound of Xerxes, but it was too dark to see anything when we reached the narrows. Passed Nagara about eight o'clock and saw the twinkling lights of Chanak. Next morning we were out in the Aegean. Sea very smooth; no vibration from the engines. We are now passing Skyros where Theseus and Rupert Brooke were buried. Poets ought to stay at home and not go to battlefields. Theseus was different; he caught a wild bull and drove him to Athens, and Dörpfeld knows where Theseus is buried in the Agora. At the Captain's table at lunch I noticed a fine-looking Catholic priest sitting at his right wearing a scarlet beret. Just before reaching Piraeus he came up and spoke to me; it was Monsignor Roncaldi and his smiling young secretary, Testa, who came to Chanak with Père Guillaud and had tea with us in Garden Villa. He was the bishop of Bulgaria, Greece, and the Islands, on his way to Crete. I was waiting to get a sight of the Poseidon Temple at Sunion, but the ship went so far south of the cape that before I knew it there was Phaleron and the Athens Acropolis shining in the sun. Into the port, and there was Costa from the American School waiting for me. Police examined passports. How much money have you? Twenty-five Turkish liras. Out through the customs, nothing opened, into fine motorcar, and away we bowled over the asphalt on the new road that heads straight for the two marble columns of the Jupiter Temple! Everything so different from the Turkey I left behind. Costa brought a note from Mrs. Broneer inviting me to lunch at the school next day. He told me all the hotels were full, and he had a temporary room engaged at the Minerve, where I lodged once in 1882 when Professor Goodwin started the American School and Harold Fowler, Jim Wheeler, and all the others were here. After settling in my room went out to send cable to Chanak announcing arrival, then went to the square to sit in front of a café and take things in. Then to the American Express near by, and there was Elizabeth Blegen with her car come to get me and said I was to come and live at their house while in Athens.

Of course I couldn't refuse and was to come next day. About 6:00 P.M. Leslie Shear called at the hotel to welcome me and said the Agora was mine and I could have every facility to work there. . . .

"May 1: Day of Joyous Workers (German imitation). Processions and bands all last night; quiet this morning. At eleven o'clock Mrs. Blegen came with the car, and I was soon installed in a comfortable chamber. In fact, it is Carl Blegen's own room with his desk and everything handy, he being away in Troy; a fine bath next door, with supply of constant hot water, and as Athens now has a plentiful supply of pure water, you can drink out of the tap without danger. Mrs. Blegen and Mrs. Hill are both leaving for Troy this week, and their motorcar and the faithful Athenase will be at my disposal. Was ever such good fortune? On reaching the house at 9 Plutarchos, I was welcomed by Marika, the Greek maid, an old friend whom I had known since 1914. Was to lunch at one o'clock with Oscar and Verna and little blue-eyed Paulos. Oscar told of his lecture trip in America last winter, going west to Chicago and California. Found that Verna was a native of Joliet, Ill., and Oscar had once lived in Chicago where I was born (three suckers together). While at lunch word came that Mrs. Shear had just had a fine boy, so we all drank 'skoal' and the Agora workmen will take new heart, for several babies (all girls) have been born to members of the Agora staff and the men got discouraged and feared another girl, which they said would be bad luck! Mr. and Mrs. Broneer went two years ago to Amphipolis to help the French archaeologists set up the big marble lion which Mr. Mac Veagh was interested in. . . . Broneer made a careful drawing of the foundation and of many fragments found on the site of engaged half-Doric columns, the capitals keyed into the wall similar to those in the Lion tomb at Cnidus, shown in C. T. Newton, so this also was probably a rectangular or square base with stepped pyramid, the lion on top.

"Whittemore has been here with Mrs. W. H. Moore on her yacht but he has gone on to Stambul. Had my tea brought to my room by Marika in the evening, and about nine I went down to the dining room to join Mrs. Hill and Mrs. Blegen who dine late at 8:30! Found Piet de Jong, Shear's Agora artist, who makes the fine drawings for the reports. He lives at the top of the house but works at the Agora during the day and only appears for dinner in the evening. Later Mr. and Mrs. Stevens called, and we had a good talk about Rome and the Villa Aurelia, where Alice and I spent that cold winter in 1929 and Stevens [Gorham P. '98] was director of the academy. He is now busy with his Parthenon drawings and goes often to the Acropolis. He said Balanos, who had charge of the reconstruction of the Parthenon, has a sedan chair to carry him up, so perhaps someday I can be carried up the Annex Museum, so full of the things I am interested in. Last night I looked through Stevens'

book on the Erechtheum and thought of the time when in 1904 he was measuring it for publication. When I passed through Athens then on my way to Dardanelles, the scaffolding was up and we climbed all over the building together, but I had to scold him for not putting the full-sized moldings in his book.

"May 2: Monday. Mrs. Blegen took me to the museum this morning to arrange for my permits for the Acropolis and all museums. We take a look into the first archaic room and saw the new marble 'Kouros' now being set up; it is stunning, also the seated Dionysus with remains of color, which I had not seen. Then to the American Express to present my passport and draw money. Found Mr. Gordon, formerly in the Stambul branch, who remembered me and soon fixed things up and gave me a checkbook. My \$400 is turned into 44,000 drachmae, which seems like a lot of money. Then I looked up Despina, Laura's former maid at Chanak, who lives with her brother here, to get her to have some shirts made, as my wardrobe has long needed replenishing. Athens seems very prosperous — plate-glass shops, and things are cheap. Bought a good pair of well-made shoes for about \$5.00. Went to Costi's for lunch. Costi came up and spoke to me. The poor chap lost an eye when out shooting and now fears total blindness. He spoke of Smyrna days before he was chased out by the 'events' of 1922, when Smyrna was captured by the Turks and burned. He came here a refugee and now owns a fine hotel and restaurant. Looked up my Athens tailor and started some new clothes which I need badly. Coming back to 9 Plutarchos, I found quite a lunch party in the salon: good Dr. Karo just arrived. Someone loaned him a house in Phaleron with a car, and he is coming to take me places. Among the company was Professor Hammond and wife from the academy in Rome and a Professor Ashmole of London University, and others. After a siesta, taxi to Sydney Nowill's, now a fine, plate-glass establishment, and bought an outfit of underthings — socks, collars, and so on. Great to find good things in a one-price shop.

"May 3: Tuesday. Glorious sunshine coming in the open window on my breakfast tray, brought by the attentive Marika. Coffee, brown bread and butter, and a glass of orange juice start the day right. Out in the court a bougainvillea in blossom and the palm tree make it quite oriental. Athenase comes with the car at nine o'clock; go to American Express to draw money and make purchases. Hermes Street: paper, envelopes, celluloid triangles, a fine, new centimeter scale (old one has a nick in it — draughtsmen know what that means), notebooks and big sheets of right kind of paper for my rubbings and full-sized moldings, which is to be my principal job in Athens. Go to the museum to call on Dr. Philadelphus, the director, a kindly old gentleman, who tells me I can photo and do what I like. Buy some fine photo post cards at the desk. Into the first archaic room where I find Ashmole and Young, the director of

Plan to attend Alumni Day, June 5

1877 Continued

the British School, at work taking photos of the new 'Kouros,' the recent addition. When I ask if I can take a small snapshot to send to Gisela Richter, they tell me that the ones they are making are for her. I don't care much for 'Kouroses' as a rule, but this one is really magnificent. It was smuggled out of Greece, got as far as Paris when the authorities heard of it, and it had to be returned.

'Just a week ago today since I left Chanak, and I feel a different man — mentally, morally, physically, spiritually. Now to end this chronicle I want to say something about the good friend Mrs. Warburg, who made the adventure possible, and I think the best way (I hope she won't mind) will be to insert her letter, which needs no explanation: 'Ever since I had the good fortune to sell "our" house to the department of fine arts of New York University, I have been longing to tell you about it. I knew it would please you to hear that the beautiful home you had helped us to place at 17 East 80th Street was going to be used for such an appropriate purpose. However I had no idea where or how I could reach you and, then, luck brought me into contact with Mr. Dilley, and Mr. Dilley made it possible for your charming friend Mr. Theron Damon to get in touch with me. This "sure is" a strange world, and I hope that my Christmas greeting to you will please you as much when you receive it as it pleased me to be able to send it. Mr. Damon had tea with me last Sunday afternoon. When he told me where you were and how you were longing to go to Greece, I confided in him that it had been my intention to send you a small Christmas gift from the house, just as a reminder of the happy hours we spent together during the construction of the house 30 years ago. Your, and now *my*, friend offered to act as our "go-between." I cannot tell you how this thought pleases me, as well as Jimmie and Bettina, who rejoice with me that you are "hale and hearty" in spite of your years. My thoughts have frequently gone in search of you, dear Mr. Bacon, and I am now anxiously looking forward to hearing all about your trip to Greece.'

'And now I must speak of my two gracious hostesses, who know what hospitality means: Mrs. Hill, busy with her job of bringing Jane Harrison's 'Monuments of Ancient Athens,' up to date, in which I am keenly interested, for Jane is the best guide book to Athens; Mrs. Blegen, scouting for her 'News Items' column in A.J.A., which is always the first thing I look for when the new number comes. They are leaving for Turkey tonight, their 'baggage checked for Troy,' and I am left alone in their beautiful house with their servants and motorcar. I feel like Monte Cristo when he escapes from the Chateau d'If, raises his hands to Heaven, and says: 'The World is mine!'

'May 4: Wednesday: After sending that 'Chronicle' I said I would confine myself to post cards, but I want to share with you some of my Athens experiences, and having found a good typist near by,

here you are! The ladies announced that we are to lunch with Mr. and Mrs. Homer Davis at Athens College, Psychiko. Mrs. Davis had tea with us in the garden at Chanak two years ago; used to teach at the girls' college in Stambul. Professor Davis is head of Athens College; fine chap, lovely house and garden, view of Pentelicus with white scars of marble quarries. Plenty of cocktails and aperitifs; marvelous lunch, 'Samosec,' and so on. Mr. and Mrs. Morgan at table, parents of Charley Morgan, director of American School; remembered them at the Grande Bretagne in 1930, when Charles and young wife just started as students; Morgan, a steel man from Worcester, trustee of Amherst, and so on. Mrs. Morgan, lively old lady; found she had been born in Maynard, near our summer home at Acton, beyond Concord. 'Batleys' greenhouse, where we used to go for pansies and geraniums. The cider mill where we took our apples, and so on. Worcester Club and Richard Ward Greene, a dear friend, and my friend Harry Bigelow was architect of their country house just back of Wachusett, so we became quite chummy and bragged of grandchildren! Coffee under the trees in the garden, with pleasant chat. Mrs. Davis a charming lady, and I have adopted her into my family of nieces.

'May 5: Thursday. Hill arrives from Cyprus but leaves soon for Corinth. My ladies, Hill and Blegen, trying to leave for Stambul and Troy: no room on steamer; wait for a Polish steamer Friday; that full, too; decide to leave by train via Salonika, Friday night at 8:30 P.M.; give them letter for Chanak. Shall miss their evening calls and talks here in my room. Run around town buying outfit, and so on.' (To be continued.) — BELVIN T. WILLIS-
TON, *Secretary*, 3 Monmouth Street, Somerville, Mass.

1886

Word has just been received of the death of William H. Chadbourn at his summer home in North Egremont, Mass., on April 16. Chadbourn came to the Institute from Wilmington, N.C. After graduation he took a postgraduate course at the University of Bonn in Germany. Upon his return to this country he began active work in the engineering profession, serving the government in the United States Engineer Office. Later he was connected with J. G. White and Company, Inc., engineers, in New York City. For many years he was chief engineer of the Chicago Great Western Railway, of which his lifelong friend and classmate, Stickney, was general manager.

During the World War, Chadbourn served under Herbert Hoover on relief work in Belgium and France. For this service to the destitute peoples in the devastated regions he was knighted by King Albert of Belgium and received the thanks of the President of the French Republic. Ever modest, quiet, he has left — both in his native country and abroad — an enviable record of efficiency and worth. In June, 1888, he was married to Miss Jennie Emerson Cheney, who sur-

vives him, as does also a son, Philip H. Chadbourn. — ARTHUR G. ROBBINS, *Secretary*, 12 Grove Street, Winchester, Mass.

1887

Rather than have a perfectly blank space where the '87 notes should be, your Secretary wishes to express his regrets that correspondence has been at an ebb. The tide was so low, in fact, that we look for it to change, and have every hope that returning floodwaters will carry with them flotsam and jetsam for the July issue. — NATHANIEL T. VERY, *Secretary*, 15 Dearborn Street, Salem, Mass.

1888

Barbara, third daughter of Mr. and Mrs. John Cornelius Runkle, was married to William Rede Hawthorne '37 on Saturday, April 29, at the First Church in Cambridge (Unitarian), Cambridge, Mass. — Albert J. Perkins, Santa Ana, Calif., sent the Secretary a clipping from *Time*, March 27, stating in detail what was being done with the \$50,000,000 trust fund established by Charles Hayden '90 for the "well-being, uplifting, and development of boys and young men." Most of us remember in our junior year "little Charlie Hayden" as he was called, in his short pants as he was accompanied to Technology each day by his fine-looking mother, but few of us, if any, imagined that he would leave his fortune for the benefit of youth in 130 institutions including his alma mater. — Ben Buttolph has sent in another bunch of class supper menus, including the famous one of March 25, 1888, at the Quincy House, of which Harry Horn delights to remind Eastman and me of my experiences with the "last cigar." These, with photographs and song sheets, bring back many fond memories. They will be on exhibition at our 51st class dinner at President Webster's home, 307 Hammond Street, Chestnut Hill, Mass., on June 4 at 6 P.M. Please try not to miss it.

John Griffin Faxon, our 50th anniversary poet and "word painter extraordinary," was requested by the Secretary to give us his impression of a four-week trip he made with Mrs. Faxon to the Pacific Coast last summer. They traveled 8,000 miles from Fitchburg and return, and here are the pictures that lingered in his mind: "The first stop was at the station-museum-shop at Albuquerque, where were displayed countless specimens of the 'craftwork' of those untaught Indians. We were sadly depressed by the countless miles of desert over which we sped, and we pitied the hapless human and brute creatures destined to exist there. The first real sight-seeing stop was at the Grand Canyon in Arizona. Its overwhelming vastness — the 12- to 20-mile width, that seemed hardly more than a hand span; the depth that shrank the roaring Colorado River into a silent silver thread; those turreted and castellated walls suggesting ancient temples and palaces in distant tracery on the reddish cliffs — these impressions challenge one's imagination as to how it all came about.

1888 Continued

"The Wonderful Mission Inn and museum and their displays at Riverside, Calif., bewilder by their refinement and are in complete contrast with the vast handiwork of nature we had just before seen. Our first day in Los Angeles was devoted to an extraordinary drive about the city and its environs, not omitting Glendale and its white marble mausoleum. On the drive we had our first sight of the Spanish in architecture — color, color everywhere and in every type of construction, such contrast with the benedictory and austere New England architecture. This was emphasized by a single Colonial house built by its eastern owner to satisfy his soul. This he did, of course, but it stands in utter disharmony amid its alien surroundings. The story of how Los Angeles, originally a city some miles from the ocean, became one of the major ports of the country is familiar and is an outstanding instance of how Californians do things. A day at Catalina Island was suggestive — in the very air itself, the color, backgrounds, costumes, architecture, everything — of the French Riviera. The Santa Cruz 'big trees' really constituted the most emotional thrill of the trip, when I placed my helpless hands against their rough bark and realized they were living things over 5,000 years ago.

"We were in and about San Francisco nine days, five of which I devoted zealously to the Rotary International Convention, for I was a delegate from our home club. A friend devoted two entire days to what might be called microscopic sight-seeing of that remarkable city. The superb view from its highest terrace revealed it broadly spread over a wide sector, the magnificent harbor, bitter Alcatraz amid the swirling tides, the Muir Woods of great trees for a remote background beyond the artificial Treasure Island dredged from the harbor for San Francisco's exposition, the mighty bridges we all have seen pictured and described, the 'bedroom' cities across the bay — these are the high spots of the huge cyclorama. A visit with kinsfolk in Oakland was followed by a stay with a cousin of my own generation in Sonora, daughter of an uncle who was born in Quincy over a hundred years ago and who went out in '49, never again to return to Massachusetts. The next community to Sonora is Columbia, which was, years and years ago, by popular election, chosen over Sonora as state capital, by a majority of two votes. Later Sacramento succeeded Columbia. A bronze tablet records these matters in detail. In Columbia are carefully preserved the cabins where Mark Twain and Bret Harte lived when they wrote their famous stories of the pioneer days. Old mining dump piles are now being profitably salvaged for gold and silver by reason of the progress of physical and chemical science.

"From Sonora's altitude of 2,000 feet we drove over a one-way surfaced, but unguarded, road to 8,200 feet before dipping into the wonders of Yosemite National Park. We left the car where the mile-high El Capitan rock-mountain

rose at our very hand — sentinel, captain, monarch of all it surveys. It compels silent awe, most truly. On one side a rushing torrent fell from snow-capped mountains, higher still, for a drop of half a mile — then a rest for the weary torrent in a pool it soon escaped from, to drop another half mile, only to rush off into the little valley stream toward the distant sea. Across the canyon Bridalveil Falls virtually duplicate this other. A drive up a 15-mile, paved, guarded highway brings one to Glacier Point, whence one sees the whole canyon and its walls close at hand. Close? It seemed as if one could touch Table Rock, the four-acre summit of El Capitan, but it was four miles away. Midgits crawled about the summit. They were venturesome climbers. At the right, a mile higher still, was pointed out the place where the huge airplane fell in March, 1938, not to be found till three months later. At the Point flaming red snowflakes pushed through the snow into the sun, and the bear cubs came up to be fed. My wife was snapped holding a huge snowball in her hands on that rare June day.

"Thence back to San Francisco, whence we left for the Yellowstone via Portland (whose other name is 'lumber,' a veritable seaport, miles up the Columbia River) and its scenic drive, over which we sped one afternoon. Entering the Yellowstone, one steps into the wonderland of geysers, for here is the largest known geyser area in the world. From tiny wisps of steam rising everywhere, they expand into the great, wonderful Old Faithful that belches out, every 64 minutes, some 15,000 gallons of boiling water to a height of 150 to 175 feet, then subsides. We stayed at the unique Old Faithful Inn for two days to get rested a bit from our strenuous activities. Then a day and night at Grand Canyon Inn, a 'modest hostel' around the walls of which one walks an even mile, if he walks it. This canyon is tiny compared to the Arizona marvel. But this is all color, color — such vividness and combinations that the rainbow is eclipsed. The steep walls confine the stream into a roaring torrent, but one may walk safely along the slopes and see and touch the vivid rocks that make the stunning picture, so nothing need escape one. The 120-mile drive out to Dodge City took us first to the park floor, which is 2,500 feet in elevation. In a complete circle, but none nearer than 75 miles, are mountains from 7,500 to 12,000 feet, ever covered with snow — a superb and dwarfing spectacle. On this drive out we ascended to 11,200 feet from pastures where grazed the herds of buffalo, deer, and other animals, through sunshine, rain, snow that covered the ground very visibly, thunder and lightning, between walls of snow from 12 to 20 feet high, still unmelted from the preceding winter. The climax to all this was the somewhat terrifying mile drop over five switchback roads hewn from the almost perpendicular rocky side of that Bear Tooth Peak. We drove from the last turn out upon a quiet road lying between richly growing farms under soft sunshine. Every minute

of these drives was a constant and compelling command to look. Then three days across the lush, flat miles of the northern states into St. Paul and Chicago, whence our last stage to Fitchburg, where we stepped from the train on the exact minute of its schedule. The summary of all this is new and increased appreciation of our great country, impressions of new personalities and their likes and dislikes — all combining into an experience of which we almost daily speak with gratitude that it had come to us." — BERT RAND R. T. COLLINS, *Secretary*, Chebeague Island, Maine.

1890

Because of the gift of the Hayden Foundation, which made possible a new home for Boston University's College of Business Administration, the late Charles Hayden was elected an associate founder of the university, and at their ninth founders' day convocation on March 13, Daniel L. Marsh, President, took Hayden as his text. After reading numerous letters from personal friends, many newspaper and magazine articles, and 53 editorial appraisements, he referred to Hayden's life as "one of the most successful, dynamic, and achieving lives America has yet produced," and referred also to his outstanding characteristics, such as his "boundless energy, his regarding of business as a high adventure, his husbandry of time, quickness of decision, remarkable memory, and magnetic personality." In closing he referred to the "new home" Boston University is building for its College of Business Administration and stated that "this magnificent structure will be forever known as the Charles Hayden Memorial." — Another memorial was noted by Charles Sherman, who in the course of his duties as a member of a committee of the Engineers' Council for Professional Development, recently had occasion to visit Northeastern University in Boston and there found "The Charles Hayden Memorial Laboratories." These chemical laboratories have also been opened within the past year.

The Secretary has received an inquiry from the Register of Former Students asking for information concerning Frederick S. Hollis who was graduated with us in chemistry and afterward took his doctor's degree at Johns Hopkins University. — GEORGE A. PACKARD, *Secretary*, 50 Congress Street, Boston, Mass. HARRY M. GOODWIN, *Assistant Secretary*, Room 4-136, M.I.T., Cambridge, Mass.

1892

Members of the Class will be interested to know that W. Spencer Hutchinson, Head of the Department of Mining Engineering, will retire at the end of the academic year this month with the title of emeritus professor. He has been a member of the Institute's Faculty for 17 years and head of his Department since 1927. As a mining engineer from 1894 to 1903, in California, Idaho, and Missouri, he obtained practical experience in the mining and milling of gold, lead, and zinc. From 1903 to 1923 Professor Hutchinson prac-

1892 Continued

ticed independently, and during this period his professional work took him to various continents and into new professional fields. During one of his trips to South America he made the discovery in Peru of a new vanadium mineral, "melanovanadite." Deposits of chrome ore took Professor Hutchinson to Australia and New Caledonia in 1917, to Southern Rhodesia in 1925. Peru, again, formed the field of his investigations in 1927 and 1928, following which he studied various mineral deposits, including iron mines, in Chile. He has also traveled extensively through Canada, Mexico, and the United States. — JOHN W. HALL, *Secretary*, 8 Hillside Street, Roxbury, Mass. W. SPENCER HUTCHINSON, *Assistant Secretary*, Room 8-219, M.I.T., Cambridge, Mass.

1894

By the time this issue reaches your hands the 45th reunion of the Class will be imminent if not a matter of the actual past. Shortly after these notes are written a letter will be sent to all members of the Class notifying them that the reunion will be at East Bay Lodge, Osterville on Cape Cod, in the same house where we have had such delightful reunions in times past. We are looking forward to a fine attendance and hope that the wives will also come in goodly numbers. Our only regret will be that many who have met with us in earlier years will no longer be among us.

Notice has recently been received of the death of Donald W. Ross, Jr., of Montreal, who died in that city on March 3, at the age of 66 years. Many of us will remember Ross and his interesting personality. After leaving the Institute he worked for several years at the Baldwin Locomotive Works at Philadelphia, Pa., and later with the Dominion Bridge Company at Montreal. He became a member of the well-known firm of Church, Ross and Company, construction engineers, and was with that company at the time of his death. Our sympathy is extended to his family and close friends.

After having arrived in this country prepared to be with us for the reunion and expecting his wife to arrive from France, Ray Price was suddenly obliged to go back to Paris. We are hopeful, however, that he can return with Mrs. Price in time to join us at East Bay Lodge. — Later class notes will give you a résumé of the doings of the Class. — SAMUEL C. PRESCOTT, *Secretary*, Room 10-405, M.I.T., Cambridge, Mass.

1895

Fred Cutter and Johnny Gardiner of New York City have been planning for some time the 44th class reunion to be held in New York City during the World's Fair. They will be our hosts, assisted by an able committee who are sponsoring this important event. The date has been set for Friday and Saturday, June 9 and 10, following Alumni Day in Boston on June 5. It is estimated, at this time, there will be an attendance of 30 odd. The reunion will include individual, as well as class, bull sessions and we hope that any-

one coming to the Fair will plan to come at this time. Pertinent information about the reunion has been mailed to the members of the Class. If you cannot attend the full session, drop in at least and say "Hello"! If possible, help increase the attendance. — LUTHER K. YODER, *Secretary*, 69 Pleasant Street, Ayer, Mass. JOHN H. GARDINER, *Assistant Secretary*, Graybar Electric Company, 420 Lexington Avenue, New York, N.Y.

1896

For some unexplained reason the Secretary seems to be lacking in material for this issue, and therefore these notes will be brief. There is, however, a real compensation for this situation in that it gives an opportunity for a last-minute plug for Alumni Day. Although there is no five-year reunion of our Class this year, the Secretaries believe that a good bunch of '96 will turn up at Technology during the day and at the Hotel Statler for the banquet and evening entertainment. Although Alumni Day is a relatively recent feature, the records show that our classmates in an increasing number every year have welcomed this opportunity for seeing one another. This is true not only at the banquet but even more so at the noon-day luncheon where the buffet service allows Alumni to circulate as they please and to make contacts in a far more satisfactory way than is afforded at other Technology events. We shall be looking for the reappearance of those who came to Alumni Day in past years, and we are hoping to see some new faces as well. It may be that Lambert N. Whitney, now that he is retired and has time for other things, can be persuaded to come, and the trip from Exeter to Boston is not so long that it should seriously deter Walter Pennell from any urge that he may experience to see again the faces of some of his classmates.

The following have replied to the Alumni Office that they expect to celebrate Alumni Day at M.I.T.: David W. Beaman, Robert A. Davis, William T. Dorrance, James M. Driscoll, Hattie L. Gates, Henry G. Grush, John S. Hallaran, William R. Hedge, Francis C. Hersey, Eugene H. Laws, Charles E. Locke, Herman C. Lythgoe, Myron E. Pierce, Elmer H. Robinson, Samuel T. Smetters, and Charles W. Tucker.

A letter from Admiral Bakenhus early in April reported his safe return from a business trip in Venezuela which had been most pleasant and profitable. While in that country he met Juan Francisco Stolk '32, who now occupies a responsible government position and is, according to Bakenhus, a very fine fellow.

From C. P. Thayer '23, Secretary of the Technology Club of Southern Florida, a clipping has been received from the Miami Sunday *Herald* of March 12 which deals with the work and activities of Elizabeth Fisher, who was a student with our Class in the Department of Geology and who is now professor emeritus of geology of Wellesley College. Although officially retired, she still maintains an active interest in her profession, and this

specific article told about some of her trips around America and abroad, and gave particularly the results and conclusions from her studies of erosion on the Florida coast and the efficacy of various types of bulkheads to resist the onslaught of the sea. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M.I.T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

1898

We have another "group letter" from Lester Gardner, in which he describes the experiences in an overnight flight in the *Yankee Clipper*. This was a test flight in the vicinity of New York. A previous group letter had described a visit to the Boeing Airplane Company's plant in Seattle, where the *Yankee Clipper* was under construction. Lester was recently honored by election as honorary fellow of the Royal Aeronautical Society of Great Britain. We quote from the New York *Times* of March 21: "Major Lester D. Gardner, American aviation executive, has been elected an honorary fellow of the Royal Aeronautical Society for his distinguished services to American aviation, it was announced today [March 20]. Only fifteen of the society's 2,500 members have been honorary fellows. The honor previously had been awarded to only two other Americans, Orville Wright and Professor J. C. Hunsaker ['12] of Massachusetts Institute of Technology. Honorary fellowship in the society is bestowed only after the award has received the approval of all the members. The Royal Aeronautical Society corresponds to the United States Institute of Aeronautical Sciences, of which Major Gardner has been secretary since 1932.

"The Royal Aeronautical Society, founded in 1866, is the oldest aeronautical organization in the world. Major Lester D. Gardner, a graduate of M.I.T., has been actively engaged in aeronautics for twenty-five years. He started the publication of the magazine *Aviation* in 1916 and was its editor for many years. He was an officer in the Army Air Service during the war. In 1928 he was president of the Aeronautical Chamber of Commerce of America. Seven years ago, with leaders in aeronautics in the United States, he organized the Institute of the Aeronautical Sciences and since then has been its executive secretary. Last year a trophy was presented to Major Gardner by members of the Institute in recognition of the many thousands of miles he has flown over world air routes in the service of aviation. He is a fellow of the Institute, secretary of the Daniel Guggenheim Medal Board and in 1927 he received the diploma of honor of the International League of Aviators. . . ."

We have received the following new addresses: David H. Blossom, I, Aberdeen, Idaho (formerly Salt Lake City); John F. Cashman, 124 Union Street, Bridgewater, Mass.; Harrington Mack, Room 220, 193 Centre Street, New York, N.Y. — Ernest F. Russ has just telephoned that he has word of the death of Allston Sargent in New York on April 16.

1898 Continued

The following resolutions were read by Joe Riley at the last meeting of the Alumni Council: "William Marshall Perley died at his home in West Medford, Mass., February 4. He was born in Medford, Mass., June 1, 1876, of New England parents. The first Perley's came to this country from Hertfordshire, England, in 1630. Perley was graduated from the M.I.T. from the Course in Chemistry with the Class of '98. The next year found him as chemist at the phosphate mines in Florida, following which he served as chemist for the Chicago and Northwestern Railway for four years, with headquarters at Chicago. Then he again returned to mining, but this time his interests were in gold and manganese in Nova Scotia, and he was associated with Professor J. W. Phelan [94]. In 1909 he became chemist for the Avery Chemical Company of Lowell, with which company he stayed until 1923 — except that from 1915 to 1916 he served as assistant superintendent of the Victor Chemical Company in Chicago. The most important product of the Avery Chemical Company was lactic acid, but during the War their activities were enlarged and Perley's war record reads: 'Provisional Lieutenant Commander, United States Naval Reserve Force (4); superintendent Avery Chemical Company, Lowell, Mass., manufacturing sulphuric acid and ammonia for explosives, iron liquor for khaki dyeing, lactic acid for tanneries and textile companies.' In 1923 Perley went to the Lactein Company of San Francisco, manufacturers of lactic acid, and he made his home in Berkeley. Here he stayed until 1931 when the business depression ruined the business of his company and he returned with his family to Massachusetts and made his home in Medford. In the latter years he has been engaged in manufacturing special chemicals used in textile coloring.

"Perley married Margaret B. Whitworth, April 26, 1899. Mrs. Perley and three daughters and three grandchildren survive him. Perley was by nature the most friendly of men. He could always be counted on by his friends and associates for help and encouragement, even for simple good-fellowship. He was regular in his attendance at meetings of his classmates, the Alumni Council, the Chemical Society, the M.I.T. Club of Northern California, and always the meeting seemed happier and more worth while for his presence. In many ways, too, he was active for the good of his community. He was vestryman at St. Clements Church, Berkeley; junior warden at Grace Episcopal Church, Medford; a member of the Red Cross, Medford; the Medford Historical Society; the Masons. He was prominent in the M.I.T. Club of Northern California, and, since his return East, has been representative of that Club in the Technology Alumni Council." — ARTHUR A. BLANCHARD, *Secretary*, Room 4-160, M.I.T., Cambridge, Mass.

1899

My last circular letter brought several responses from men missing to these many years. Edwin Samuels of Baltimore

had written me of Frederick Lambert, and now Lambert has written me personally. He jogged my memory a bit, and I remembered him as senior officer of the M.I.T. Battalion and captain of A Company. Lambert left us to enter medical school and is a graduate of Boston University School of Medicine and Harvard Medical School. He practiced in Salem a few years, then went to Tyngsboro in 1908, where he married a daughter of Channing Whitaker, Professor of Mechanical Engineering at the Institute. He told me William A. Kinsman was an old friend, but he hasn't seen him for many years.

W. S. Newell is president of the Bath Iron Works, and there is no foundation to the rumor that the plant has been sold. Newell came to Washington for the annual dinner of the Naval Engineers, and I saw him for a few moments. Arthur L. Hamilton visited in Washington for a few days the latter part of April, and we spent several hours together. Part of our discussions were anent the class reunion. The saga of the 40th reunion will reach you via the first autumn issue of *The Review*. This is being written in April, hence I am somewhat handicapped in describing what happened. I might, of course, take to crystal gazing. The other things we discussed were as varied as Carroll's "shoes — and ships — and sealing-wax . . . cabbages — and kings." Hamilton is ace publicist for the reunion.

Through the post recently I received a circular describing the second edition of the American Chemical Society's Monograph No. 30, entitled, "Casein — And Its Industrial Applications." I have not had a chance to read the book, but I have read the table of contents. Casein may be just a milk product for most of us, but to Sutermeister it is a new world — a world of romance. It is used in brake linings, buttons, cosmetics, foods of various kinds, paints and paint removers, plastics and plywoods, synthetic food and synthetic wool, woodworking glues, and so on. I trust Sutermeister will be at the reunion. — I have received a copy of Bulletin No. 249 of the Mining and Metallurgical Society of America, in which there is an article, entitled, "The Price of Gold," by Arthur B. Foote. Foote sent me also a copy of his letter to Assemblyman Yorty of Sacramento, Calif., in which he points out the fallacy of trying to increase wealth by paying people not to produce it.

It is with regret that I advise you of the death of William E. West last month. George Higgins died in November, and Rose Carrigan in November, 1937. — W. MALCOLM CORSE, *Secretary*, 1901 Wyoming Avenue, Northwest, Washington, D. C. ARTHUR H. BROWN, *Assistant Secretary*, 53 State Street, Boston, Mass.

1900

We have learned from the postmaster at Ayer, Mass., of the death in 1925 of Alfred J. Atwood who was in this Class in the freshman year. — Miss Carlotta Constantine, who was injured in the airplane crash which resulted in the deaths of B. H. Rumsey and D. S. Roosevelt last

April in Mexico City, is the daughter of Arthur M. Constantine, IX, International News Service correspondent in Mexico. Arthur was, for a number of years, assistant Sunday editor of the *Boston Herald*. While on the staff of the *Boston Journal*, he was assigned to report the American occupation of Mexico by the American forces. Previously he had been to Mexico as a companion of Porter Adams '14, now President of Norwich University, Northfield, Vt. On this second visit Mr. Constantine decided to stay in Mexico for the remainder of his life. He married Miss Amada Moran y Mariscal, daughter of Diaz' secretary of foreign affairs. They have lived in Mexico City ever since, except for a period during the World War, when he was in Washington, attached to the Federal service. Carlotta is the oldest of three children, the others being Laura and Arthur, Jr. She was educated at Northampton and Sarah Lawrence colleges, returning to her home in Mexico last summer. She took a prominent part in the activities of her classes and was regarded as one of the most beautiful of the students. The Constantines are prominent in American and English society in Mexico City. — C. BURTON COTTING, *Secretary*, 111 Devonshire Street, Boston, Mass.

1901

Your Secretary very much regrets that a bad attack of the gripe prevented him from preparing the class notes for the May edition of *The Review*. Consequently, a number of news items have accumulated and will be divided in chronological order between the June and July editions.

First, however, special mention should be made of Alumni Day, June 5, at M.I.T. and of Commencement Day, June 6, when graduating exercises will be held at Symphony Hall, and later on the President's reception to the graduating class and Alumni, at Walker Memorial. The events of those two days will, as always, be most worth while, but if you cannot arrange to attend during the day, be sure to make a special effort to attend the Alumni Banquet at the Hotel Statler on the evening of June 5. Last year's Alumni Banquet was particularly interesting, and those who started a collection of steins at that time should add another attractive container on June 5.

In the April *Review* reference was made to the death of Huse Blanchard on November 4. Since then Bill Vermilye has very thoughtfully sent in the following notes regarding some of Blanchard's accomplishments as an architect: "For the two summers before Huse Blanchard was graduated from Course IV he was employed by Carrere and Hastings. You will remember that at that time Carrere and Hastings and McKim, Mead and White were the two leading firms of architects in the United States. Blanchard spent several years with Carrere and Hastings after he was graduated. Aside from this, he maintained an independent business of his own. He specialized in small libraries and in public school buildings. His first artistic achievement

Plan to attend Alumni Day, June 5

1901 Continued

was the library in Great Barrington, Mass., which, for its size, is one of the best in the country. He did many public school buildings, particularly in the East, and could have done much more except for his insistence upon doing all of the work in connection with each project, from the time he helped the local city fathers raise the money to build the building until the last desk was moved in. All of his work was painstaking, and he could never be led astray from his ideals of purity in design." Vermilye also wrote that in Blanchard's will he provided that his sister should have a life interest in his estate but that at her death M.I.T. should receive one-sixth of the total. Bill indicated that while the estate was not large, this bequest surely showed that Blanchard's heart was, as always, in the right place.

Since the preparation of April class notes we have heard through Phil Moore of the death at Chicago on October 10 of Gustaf E. Gustafson who graduated from Technology in the Course in Civil Engineering. Phil sent me a letter which he received from Mrs. Gustafson, which stated that the death on May 16, 1938, of his daughter Ruth grieved her father so much that it very possibly was the direct cause of his death from a cerebral hemorrhage and other complications. Phil also sent a memorandum of the important work done by Gustafson during his life as a civil engineer, which included the completion of contracts covering values of several hundred million dollars for the construction of bank buildings, railway stations, hotels, office buildings, public buildings, and numerous other miscellaneous structures. Mrs. Gustafson also sent Phil a copy of the paper published in November by Gustafson's church which included the following very appropriate memorial for our old friend: "Mr. Gustafson was an engineer of the old school and was by nature and training fitted for great thoroughness. He was characterized by an unusual modesty and many of his best friends had little knowledge of his gifts. He planned many of the large structures in this city and in other cities of the country. Brother Gustafson was a devoted Christian and an humble follower of our common Saviour. He was a lover of his home and was passionately fond of his wife and daughters. It is thought that the loss of their daughter, Ruth Gustafson Hoffman, last May, accentuated his own failing health and was largely responsible for the break which caused his death. There is, besides the sorrowing wife, only one child, a daughter, Amy Gustafson Kuehn. The whole congregation joins in sympathy for these sorrowing friends."

Through Ted Lange at Springfield we have also been informed of the sudden death at Hadley, Mass., on April 7, of our good friend, Bob Montgomery. Bob was born in Natick, Mass., which was also the home town of your Secretary, and besides being good friends before we went to Tech, we roomed together in Boston for two years while we were at Tech and for a few years thereafter saw quite a lot

of each other. Immediately after finishing at Tech in Course V, Bob was manager of the Woods paint factory at Wellesley but in 1910 went to Amherst, Mass., where he was associated with his father and brother Alec in establishing and operating the extensive Montgomery Rose Gardens at Hadley. Class notes in the February Review gave a brief account of the operations of the Montgomery Company, Inc., which developed a number of wonderful roses, two of the very well-known varieties being the Talisman and the Crusader. Bob's wife died in 1931, and that saddened him very greatly, but his dearly beloved daughter Ann helped to make his later years as happy as possible. Bob's mother, a wonderful old lady, is still alive and he also left a brother and two married sisters who reside in Natick, Mass., his father and his brother Alec having died several years ago. Bob was very active in Masonry and in a number of local activities, and one of his important interests was that of trustee of the Hampshire-Franklin Boy Scout group. He was also a past chairman of the Rotary Club Boy Scout troop and past commissioner of the Amherst District Boy Scouts.

During recent visits to Worcester, Mass., your Secretary has had the pleasure of several meetings with George Cross, who, since he retired from the Army, has been director of the Worcester Historical Society, which is an exceedingly interesting institution. In the society's building at 39 Salisbury Street, Worcester, there are on exhibition a tremendous number of very interesting items, both large and small, of early Americana. Among other items are 40 of the John Rogers statuary groups, and there are many other things of great value and interest. If any classmates should happen to be in Worcester, they can most interestingly renew friendship with Captain Cross and spend a most enjoyable time with him at the rooms of the Historical Society.

Paul Hilken has finally decided to shake off the dust of New York and to make his home for the rest of his life in Connecticut. Paul writes that he has bought a farm of 14 acres in Franklin, which is near Willimantic, and that he has a very comfortable home from which there is a glorious view across the Shetucket Valley to the hills beyond. He states that it is the sort of place one dreams about, and although your Secretary has not as yet had the pleasure of making Paul a visit in his new home, he hopes to in the near future and hopes also to renew friendship with Paul more frequently here in Hartford. Judging from what he stated, Paul will probably continue to do some business here in Connecticut for Clarence Hodson and Company, Inc., but we imagine that he is going to be principally interested in enjoying life as a country gentleman.

For the past two years Bill Vermilye has very considerably sent your Secretary copies of interesting talks which he has given and which have been printed for distribution. The talk for 1937 was en-

titled "Economic Trends in Manufacturing and Sales" and was delivered at the Franklin Institute in Philadelphia, while the 1938 talk was entitled "Power in the Textile Industry" and was delivered by him at the Union League Club as a member of the Newcomen Society. This year's talk was entitled "Human Understanding in Industry" and was delivered by Bill before the department of economics and social institutions of Princeton University. Each of these talks was extremely interesting and the three make a very comprehensive series for those interested in industrial management. As vice-president of the National City Bank of New York, Bill now makes good use of his past experience in industrial production, sales, and financial management, and it is of special interest to know that his interest in industrial management led him to found the Vermilye Medal, which is awarded biennially by the Franklin Institute of the State of Pennsylvania "in recognition of outstanding contribution within the field of industrial management."

Harry Dart, who was graduated from the Course in Electrical Engineering but who is now assistant secretary of the Hartford Steam Boiler Inspection and Insurance Company of Hartford, has recently celebrated his 25th anniversary with that company and received many flowers and gifts in commemoration of the occasion. Harry's home office is right across the street from The Travelers, and I hope to have luncheon with him some time soon so that we may compare notes on our companies and so that his promise to attend our 40th reunion may be secured.

Claude Patch, who started with the Class of 1901 (Course in Naval Architecture and Marine Engineering), but who finished with '02 because of taking part in the Spanish-American War, took a trip around the world last year and has recently written such an interesting letter about the trip and about some of our classmates whom he contacted, that we are quoting therefrom as follows: "You may recall that a wave of patriotism carried me from the Class of '01 to '02 via Cuba and Puerto Rico in 1898. I still, however, look up '01 men when I am about, and on my recent perambulations have contacted the following: At Los Angeles, I called on Francis K. Baxter, who is a specialist with the Internal Revenue, dealing, I believe, with oil properties. At Portland, Ore., I had just time enough while my train lay in the station to call up Ellis Fuller Lawrence. Unfortunately I could not accept his invitation to lunch."

"At Chicago, as I usually do, I called on F. Willard Puckey at his office up in the tower of the Wrigley Building. At San Francisco, I called the Marcus home by phone and was shocked to learn that Henry had died only a few weeks before. I called Perk Parrock's phone number but was informed that the phone had been removed, so I missed Perk. (Note by Secretary: Perk had moved and new location is 1860 Jackson Street, San Francisco.) At Honolulu I had pleasant reunions with Lyman Bigelow, who did a

1901 Continued

fine job for the Islands as superintendent of public works — maybe the title is wrong. In connection with my work I had to read quite a voluminous report on the harbor system of Hawaii published by the Chamber of Commerce and quote as follows: 'Considering the limitations under which they must operate, our Harbor Board and their personnel, particularly Messrs. Bigelow, Rush, Untermann and Browne, are making a splendid job of the administration and operation of our harbors. . . . but the weak point is that under our organization in practice the board's control over the harbor system only goes so far as the harbor executive cares to permit it. Under Mr. Bigelow all has been satisfactory but in my opinion we should consider shifting to the otherwise universal practice of having the Harbor Board designate and employ the port director.' Unfortunately, in spite of the fact that Lyman had previously served other changes in Island governors, the New Deal wanted his job. Lyman has a delightfully located home over at Kaneohe. I talked with Foljame over the phone, but the day I called at his home in Los Angeles he was out."

Claude wrote from 862 Park Square Building, Boston, Mass., so we surely hope that he may be present on Alumni Day or at the Alumni Dinner in the evening. There was another Patch in our Class, by the name of Nathaniel, who has been located in Buffalo for some time as secretary and advertising manager of the Lumen Bearing Company, bronze and brass founders. Nat wrote me recently in reply to a letter I had written to him, and I quote from his letter: "Now as to items for the class news. There is very little to tell. Things have moved along about so and so. The effect of the New Deal and other experiments have not been all that their proponents prophesied. As a matter of fact I think I could have told them before they got started that they were not going to succeed, but of course they did not ask and doubtless they did not care what my opinion was. I have had practically to give up active work. Except for a little writing by way of dictating some of my experiences as a brass founder, I really have not been very active. This of course is on account of my failing eyesight. I have done almost no traveling, finding it much safer to stay at home, where I know my way around and can feel my way where I do not know it. Consequently, I have not had a chance to drop in on you at Hartford. Why don't you come to Buffalo and study the conditions of your agents here? I would love to see you and renew old acquaintances. Maybe you might be able to refresh my memory to the point where I could think of something that would be of interest to the rest of my classmates." We hope that we may have occasion to go to Buffalo and we hope also that if Nat should happen to have to be in Boston about June 5, he can join the '01 delegation at the Alumni Dinner.

"Believe it or not Ripley" has nothing on the Class of '01: Our classmate Fred W. Connolly, who was a chemist at Tech, now

owns and operates Connolly's Reliable Drug Store in Dorchester, Mass., and the surprising thing is that he operates it strictly as a prescription pharmacy and does not have any permit to purchase or sell liquor for his store, what alcohol he needs for prescriptions being secured from a neighboring drugstore. As a matter of fact, Fred does not personally use alcohol in any form, but we know he enjoys attending alumni dinners, and even if he does not indulge in the stuff that some consider to be cheering, there will be a "stein on the table" for those who do wish so to indulge. Incidentally, as previously noted, the steins will be attractively designed and may be taken home as souvenirs of the occasion. That privilege may for some detract from the attractiveness of the occasion, but there will probably be other things which can be "snatched" if anybody wishes to indulge in old-time practices.

Matt Cushing, the proprietor of the Cushing Ranch at Saratoga, Wyo., wrote as follows: "Nothing much of interest to a Tech man out here unless it be sentimentally in the fact that the old range cow is headed down the long trail to the dear old farm, to give way to the black-tail and the antelope, maybe the buffalo, perhaps the redskin (I am very fond of all these) if the soil conservation ultra-enthusiasts have their way. The principles that this western country was built on and made income bearing have been frowned on by whimsical visionaries; that the old cowman is on his way out must satisfy the cravings of some of the smug Easterners who demand the disintegration of the fast vanishing cattle herds, grazing on 'free government range' and destroying erstwhile verdant prairie, nature's last playground. We do hope these powerful minds of science and economics, heavily degreed by our great universities, are on the right trail." We wish we could visit Matt's ranch, for his comments sound interesting. However, as it is not likely that we will be getting out to Wyoming in the near future, we hope that maybe, some way, Matt can arrange to come to our 40th reunion, even if we can't have the pleasure of seeing him before that time.

Mansfield Estabrook wrote from 22 East 40th Street, New York City, and he very briefly stated that he is interested in industrial real estate. — Fred Freeman wrote just as briefly from 252 Spring Street, Portland, Maine, where he continues as a manufacturer of New England type rugs and carpets, under the title of the New England Guild. — Alec Taylor wrote from 1064 Du Pont Building, Wilmington, Del., but sent forward no news. — Milton Hogle wrote that he continues as factory manager of the Hopeman Lumber and Manufacturing Company, 569 Lyle Avenue, Rochester, N.Y. — Allen McDaniel, who has changed his address to Waterford, Va., writes that he has recently finished a special assignment as consultant for the National Resources Committee on its report of national energy resources, and that he expected to start south soon on a farm chemurgic sur-

vey. That last sounds intriguing, so will hope to hear more later. — Alec Jeffords wrote from the Trundle Engineering Company of 1501 Euclid Avenue, Cleveland, Ohio, to ask for Joe Evans' address, but did not tell anything about his own experiences. He did, however, mention that he had seen Lamont du Pont, who told him of the good time enjoyed at our 35th reunion. We, therefore, hope that Alec can surely attend the 40th get-together. — Howard Wood, who lives near Hartford at Rockville, Conn., attends some of the Hartford Tech Club dinners, and I have the pleasure of comparing notes with him from time to time. Howard is retired from business but appears to find much that is worth while to occupy his time.

Ted Taft, who does honor to the Class as professor at M.I.T., will surely be on hand on Alumni Day and will be holding open house at his office. We hope that he will be at the Alumni Dinner also. — Farnum Dorsey of 205 Garfield Place, South Orange, N.J., indicates that most of his time is spent in connection with trade-mark matters for the Socony-Vacuum Oil Company. He mentions, however, that the scientific aspect is nil; we judge that the financial basis of his occupation is much more satisfactory. — Arthur Davis, whom I saw again at Gloucester last summer and who continues as president of the Frank E. Davis Fish Company, was not very enthusiastic as to prospects in his own line, but we trust that he may be agreeably disappointed by a fine upturn in business during the years to come. — Ed Beckwith of Garrison, N.Y., was very uncommunicative on his data sheet this year, so we hope that he will soon be taking another interesting trip which he can write about as he did in 1937. — Donald Kohr, who spent only his senior year at Tech, is president of the Lowe Brothers Company, manufacturers of paints, varnishes, and lacquers at 424-450 East Third Street, Dayton, Ohio; moreover, even although he was at Tech for only one year, we will all be just as anxious to see him on the occasion of our 40th reunion. — Ralph Stearns, who makes his home at 32 Elm Rock Road, Bronxville, N.Y., and whose invitation to visit him there we hope to be able to accept sometime soon, keeps us posted regarding the doings of some of our other classmates but is much too modest about himself. — Arthur Hayden, who we believe has retired from business, wrote from 9 Florida Avenue, Bronxville, N.Y., that we may have the pleasure of seeing him sometime here in Hartford. We hope that is not a false prophecy. — Percy Goodwin briefly stated on his data sheet that he is assistant superintendent of construction, Veterans Administration, Bedford, Mass., but gave his residence address as Box 326, Kennebunkport, Maine. — No news from Arch Klieves except to state that his post office box has been changed to No. 127, Wheeling, W.Va. — Charlie Auer, mining engineer at El Paso, Texas, wrote that his Tech Club down there was again favored this year by a visit from Dean

Plan to attend Alumni Day, June 5

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Lobdell '17. Charlie stated that he took the Dean to a party which was given in his honor by the faculty and students of the New Mexico College of Agriculture and Mechanic Arts and that the Dean certainly held his own with the ladies and is mighty good company. Charlie said that Dean Lobdell spent about five days in Texas and made a lot of new friends for M.I.T. We are sure that he has very much appreciated Auer's good work as honorary secretary for M.I.T. at El Paso.

Willard Dow, our busy Assistant Secretary, wrote in briefly to state that Perk Parrock's daughter was recently married. Incidentally, Phil Moore has also been having some experiences along those lines and writes: "My oldest son, Philip, Jr., was married the last of November, which leaves me, in golf parlance, two up and one to go in the marriage score." Ed Seaver, whom I have the good fortune to see occasionally in Boston, has not sent in any recent news but we understand that his company, the Foster Wheeler Corporation, is reasonably prosperous, and we certainly hope to see Ed at the Alumni Dinner on June 5.

The Alumni Office sends in 99 South Downing Street, Denver, Colo., as the present address of Joseph A. Garvin who has been on the missing-address list at least as far back as 1926. The Alumni Office also gives the following addresses: Charles W. Adams, 126 State Street, Montpelier, Vt.; Harry R. Healy, 90 Harvard Avenue, Brookline, Mass.; Ralph S. Loring, 987 East Mountain, Pasadena, Calif.; Hector MacNeil, Highway Department, Province of Nova Scotia, Sydney, Nova Scotia; and Clarence L. Brown, 217 9th Avenue, Haddon Heights, N.J. — ROGER W. WIGHT, Secretary, The Travelers Fire Insurance Company, 700 Main Street, Hartford, Conn. WILLARD W. DOW, C.P.A., Assistant Secretary, 20 Beacon Street, Boston, Mass.

1902

A letter has been received from our Class Vice-President in Chicago, Fitzgerald. He and Ken Lockett were the only two of the Class present at the Technology Club meeting held on March 2, at which President Compton was the speaker. Fitzgerald says that he meets Pete Currey once in a while but seldom any other classmate. He reports that Edward Burnham, Jr., who was engaged in the insurance business, passed away last August. — Robbie sent in a clipping announcing the death in Fitchburg on March 5 of the wife of Earl Pitts, Mrs. Mabelle T. S. Pitts. Their son died only a few months ago, but a daughter, Mrs. J. Kendall Fullerton, resides in Alexandria, La. The Secretary extends the sympathy of the Class to Pitts and his daughter.

A letter has been received from McCarthy, X, in reply to one written a year ago. Although slow in arriving, it is nonetheless welcome. Mac is at present located at Fort William McKinley, Rizal, P.I., where he has been serving a detail on the general staff as assistant chief of staff, G-4 of the Philippine division of the Army. However, Mac expects to get

nearer to us and will leave the Philippines in June, and after a westward trip home will be stationed at Trenton, N.J., as divisional instructor of the 44th Division, National Guard. One of his daughters will return with him, while the other, married to a lieutenant stationed at Fort McKinley, will remain behind. We hope that Charlie keeps his promise of looking up the Tech men in northern New Jersey when he gets settled in Trenton.

Dan Patch has returned from another trip into the Northwest and has made his report of '02 men whom he encountered. In Minneapolis he looked up Nichols and found him eager to hear class news, as he has had little contact with Tech of late. He promises to attend the 40th reunion if all goes well. Lind was also contacted. He will be in Boston in September at the annual meeting of the American Chemical Society and hopes to see some of us. — BURTON G. PHILBRICK, Secretary, 246 Stuart Street, Boston, Mass.

1904

I want to remind you of the 35th anniversary reunion of the Class to be held June 23, 24, and 25 at Boxwood Manor, Old Lyme, Conn. Full details regarding the reunion are already in your hands; these words are simply to remind those classmates who read *The Review* not to forget the dates, and to urge their attendance. Because of the location of Boxwood Manor, halfway between New York and Boston, accessible by train or automobile, we expect a big turnout and the occasion is one which no classmate should miss. Just in case I do not see you at the reunion, I wish you a most pleasant and enjoyable summer and vacation. — HENRY W. STEVENS, Secretary, 12 Garrison Street, Chestnut Hill, Mass. AMASA M. HOLCOMBE, Assistant Secretary, 4817 Woodway Lane, Northwest, Washington, D.C.

1905

Some of you who feared that our 34th reunion at Old Lyme would be "washed out" by the damage of the hurricane of last September will be reassured by the words of Host Dows, who for some reason or other will be glad to see us again. He writes: "The hurricane did some A-1 stuff here last September as far as apple trees and elms form the picture. The steady preceding rains had softened up the ground, and when the big wind came (going out of the storm center), the trees with any foliage went over like goblets on a table. But my men all proved to have been Maine logging-camp workers when they first came to this country, and in six weeks they cleaned up roots and all. We had too many trees anyway, and now the place has a distinctly younger look. The lawns have a chance and the gardens are no longer hidden. Around Gardenside all the trees stood. It was on the street and in the orchard where the battle raged, and most of the trees fell. The buildings were very sturdy, however, and were unhurt except at the beach. The cottage where the bathhouses were stood up; the other bowed to the ocean. . . ."

Accordingly, we officially and enthusiastically announce that the dates are June 2, 3, 4. The traveling instructions are about as in previous years. The Boston contingent will leave Walker Memorial, Friday at 3 P.M., arriving in time for dinner. Reservations will be made for those not desiring to drive. The New York crowd (and we hope crowd is the proper term) will leave also on Friday afternoon. Those registering will be notified as to tour captain and sailing time. Sailing is right, as Ray Bell is to sail across from Long Island — no last minute Chicago trips for Ray this year — and Dave Bridges will be with him as first mate. Anyone wishing to ship before the mast may obtain transportation by getting in touch with Ray at his New York office, 205 East 42d Street. Others from points north, south, and west will be informed of the plans for reaching Old Lyme on receipt of their applications. Since there is much important business to transact, a large representation is urged. One important matter is the further discussion of subsidization of expenses for the 25th reunion in 1940. The committee appointed in 1938, after reporting their considerations to the Boston group at the midwinter meeting in Boston, decided that it would be best to refer the matter to the Old Lyme group for further discussion and instructions. Then there are golf and tennis championships to be decided and a few more pilots to be selected for the Sunday sail on Bell's good ship *Yankee*.

At the midwinter meeting in Boston, the Secretary announced that because of the weakened condition of the treasury, an assessment of \$2.00 for 1939 class dues must be made, which met with hearty response from those present. An official announcement of this was contained in your mailed announcement of the Old Lyme program. One reason for this assessment is that only 25 per cent of the mailing-list membership responded to the last one in 1937, which probably means that most of the men either do not take *The Review* or do not open class correspondence. Here's hoping for a larger percentage this time.

We have been having quite a bit of fun here in Boston due to the fact that Ros Davis, spurned, as well as the rest of us, in his effort to get the "powers above" at M.I.T. to remove to Cambridge a decent symbol of the expiring Rogers Building, decided to make an attempt to obtain for '05 a token of the "good old days." Apparently realizing that the Secretary was somewhere in New England, Ros telegraphed Admiral Fisher to "get the sign — 291 Boylston Street." Andy and Sid made the attempt and almost succeeded, only to find just as they were about to load the sign into Sid's car that the insurance company which had purchased the building had prior rights and wished the sign as a memorial. If we had had around at the time the old gang that licked Harvard and the cops the same night, the *pièce de résistance* would grace our quarters at Old Lyme this month. Thanks, Ros, Andy, and Sid, anyway.

1905 Continued

Samuel Shapira, III, after conducting a vigorous political campaign, has been elected class representative to the Alumni Council and has been duly inducted to office. Sam replaces Strickland, who felt he had had the honor and salary long enough. And darned if Sam doesn't seem to like it.

At Easter came a resurrection: Early in March we had learned through the postmaster at Staunton, Va., that Edward S. Baker, VI, had died sometime, he did not know when. The Staunton newspapers couldn't find any obituary, but one editor located a lady who knew his sister and her address. On writing her for the story of the sad news, we received the following letter from Baker himself, address 3449 North Smedley Street, Philadelphia, Pa.: "I am sorry you have had so much trouble locating me but as you see the postmaster in Staunton, Va., made a mistake, I am glad to say. I did attend M.I.T. for two years, around 1900 or 1901, and took the Electrical Engineering Course and left there as a third-year special, as I obtained credit for work I had at another engineering institution. After leaving Tech, I worked in several electrical manufacturing companies, one of which was the General Electric Company in Schenectady, N.Y., where I worked as an engineering student in their testing department as they called it then, for two years. After this I completed my electrical engineering course at Purdue University, where I was graduated in 1910. After graduating from Purdue, I worked in New York City for a little over a year and then came to Philadelphia where I have been ever since. I have been connected with the gas company for seven years and the Western Electric Company for 12 years and several other companies at various times in this city. I have met only one person in the Class I attended while at M.I.T. since leaving there and his name is Haar ('04). I saw him about six years ago at a meeting at the American Institute of Electrical Engineers in New York City. Although many years had passed since I last saw him, he looked in many respects as he did when attending Tech." In spite of the mistake as to Baker's demise, we dare to announce the deaths of two other members of the Class: Edgar L. Meyer, II, died on April 11, 1935, place undetermined, in spite of your Secretary's attempt to obtain information at the last known address, Pasadena, Calif. Our ten-year book reported him then in Bermuda, but a letter to the concern he was with has not been answered.

James A. Pitts, II, died, apparently in Canada on February 13. Jim entered with the Class of 1904. Your Secretary has a valued picture of a bunch of Course II fellows playing duck on the rock on the vacant lot opposite Engineering A, in which were included Pitts, Ned Broad, Joe Baker, Jack Flynn, Sid Cole, and so on. Our records followed Pitts to South Africa, where he apparently was in 1915, but since then no information. If any of his old pals have followed him in recent years, please notify the Secretary.

Hallet R. Robbins, I, has retired from active professional work, following 11 years with the Oriental Consolidated Mining Company, first as consulting metallurgical engineer at Hokuchin, Chosen, and later as agent with headquarters at Glendale, Calif. His company had been obliged to discontinue practically all purchases of equipment and supplies in the United States because of the foreign exchange regulations in effect in Japan. Robbins is now at Palm Springs, Calif. — Carroll C. Curtis, IX, announces a connection with Gordon B. Hanlon and Company, members of Boston Stock Exchange, with offices at 10 Post Office Square, Boston. No doubt Carroll would be glad to take care of your surplus funds through wise investments. — Louis J. Killion, I, tried to slip by your Secretary on the street recently but confessed that he is now (or still) vice-president of the E. F. Hauserman Company of Cleveland, Ohio, movable steel partitions, with office in Boston. He almost promised to play the piano for us at Old Lyme this year.

These new addresses reach us. It is apparent in some cases that they are the home addresses, whereas previous ones may have been business locations. Every change of address causes a personal letter from the Secretary in an endeavor to catch up on some missing history, but unfortunately most of these arrows vanish in empty air, which makes the Secretary's job the harder. Edward C. Grant, XIII, 16350 Second Boulevard, Detroit, Mich.; Louis J. T. Decary, IV, Apartment 15, 1310 Maisonneuve Street, Montreal, Québec; Albert H. Smith, XIII, 10603 South Yates Street, Chicago, Ill.; William S. Mann, III, Post Office Box 245, Healdsburg, Calif.; Adolph J. Orseifen, 7455 Greenview, Chicago, Ill.

By the time this reaches you, you will have received a rather unpretentious, but perhaps important to some, résumé of the class notes for 1938. This was compiled after the Secretary came to the realization that only about 25 per cent of the Class get *The Review*, leaving the balance without the class contacts which come with the stories in *The Review*. If the idea makes a hit with the other 75 per cent, it can be made an annual event — but you can assure yourself of news while it is news by subscribing to *The Review*. If you can't make Old Lyme this year, plan your time for the Big 35th in 1940. Near Boston men should take in Alumni Day and the Alumni Dinner where '05 will, as usual, have a banner representation. — FRED W. GOLDTHWAIT, *Secretary*, 274 Franklin Street, Boston, Mass. SIDNEY T. STRICKLAND, *Assistant Secretary*, 75 State Street, Boston, Mass.

1906

The Arrowhead, published by the Anaconda Copper Mining Club, contained in March the following about Earl Bardwell, III: "Mr. E. S. Bardwell, superintendent of the copper refineries at the Great Falls Reduction Works of the Anaconda Copper Mining Co., was born in Florence, Mass., on June 28, 1880.

After a growing-up period but little different from the other youths of his time he entered Northampton high school and was graduated from that institution in 1900. His first real job upon graduation was as a clerk in a drug store with hours from 6 A.M. to 11 P.M. and a weekly wage of three dollars. From this he moved on to clerking in a bookstore with the same weekly wage but shorter hours. He next ventured into the silk business, having obtained employment in the shipping room of the Corticelli Silk Co. In a short time he was made foreman of the embroidery department which entailed the pitting of his wits against those of the sixty girls working under him. As can well be imagined, considerable practical psychology was necessitated. He was sufficiently successful so that the job was kept open for him for summer employment while attending college and was not permanently filled until he had graduated.

"He entered Massachusetts Institute of Technology on a scholarship in September, 1902, and was graduated with a Bachelor of Science degree in Mining and Metallurgy in June, 1906. In order to enter M.I.T. it was necessary for 'Bard', as he is more commonly known here, to pass an entrance examination in, among other subjects, solid geometry, a course which he had not had in high school. He recalls that he studied solid geometry twenty-four hours a day for three days previous to the examination and passed. His first employment upon graduation was as a private assistant to Robert H. Richards [68] in connection with investigations in ore dressing. In July, 1907, he ventured west and went to Georgetown, Colorado, as mill superintendent for the Democrat Mountain Mining Co. This company was forced to close down during the hard times of 1908 and he returned to Boston to edit volumes three and four of Richards' series on *Ore Dressing* and a text book on *Ore Dressing* by the same author. During 1909 and 1910 he built and operated a plant in South Danbury, N.H., for United Mills Co. of Boston for the recovery of garnet. 'Bard' came to Great Falls in December, 1910, and first worked with Mr. Wiggin in connection with ore dressing investigations being carried on at that time. By 1913 he was superintendent of concentration of the Great Falls plant and also carrying out investigations in regards to the metallography of copper. During 1914 and 1915 he put in and had charge of the exhibit of the Anaconda Company at the Panama Pacific Exposition held at San Francisco. He returned to Great Falls in April, 1915, as metallurgist of the Great Falls operations. When the Ferro-Manganese Plant began operations in 1918, 'Bard' was in charge as superintendent and held this position while the plant operated. In March, 1926, he succeeded Mr. Burns as superintendent of the Copper Refineries, the position he now holds."

Thanks to Harold Coes for the following newsy letter from New York on April 11: "I had to make a business trip to Honolulu recently on some professional

1906 Continued

work in connection with the pineapple industry and found that one of my clients was a '95 man. Of course I looked up Sid Carr, and he, J. F. Morgan, Jr., '14, and I had lunch together. I hadn't seen Sid since the reunion at Oyster Harbors several years ago. He asked to be remembered to all of the classmates that I saw on my return, and this seems to me the best way to transmit the message. We enjoyed our visit to the Hawaiian Islands; as a matter of fact I was on six of them. While some of our classmates in California probably would not agree to this, yet they have in Hawaii the kind of climate that California talks about. I had never been there before and was very much interested in the economic development of the Islands."

Included in the material received from the Alumni Office for these notes was a clipping from *Patchwork*, the house organ of the E. L. Patch Company of Stoneham, Mass. Said clipping included two pictures of our classmate, Ralph R. In one, he was presenting a fellow worker with a gold medal and a testimonial in recognition of 50 years of service with the company. In the second, Ralph was on the receiving end of the presentation, gaining to the extent of a new beaded screen and an assortment of camera accessories for the further enjoyment of his motion picture hobby. These gifts were a token of esteem from the members of the company to Ralph as president. The writer hereby notifies the classmate in question that he will be expected to include his motion pictures with those of some of the other movie fans in the Class at the next reunion, if not before.

The Secretary acknowledges a post card from Buenos Aires from the Philbricks, who have been touring in that section this past winter. — A note dated March 31 has been received from Jack Norton, who is with the Upjohn Company at Kalamazoo, Mich. The note accompanied a clipping reporting the death of D. A. Stewart, II, who was a resident of Kalamazoo. The clipping was taken from the *Kalamazoo Gazette* of March 30: "Donald A. Stewart, 56, president of the Stewart-Kingscott Company, architectural engineers, died suddenly last night after a heart attack in the Porter hotel, Lansing, where he was attending a meeting of architects and engineers. He died before he had an opportunity to register. Mr. Stewart's death came as a shock to his relatives and friends, who said he had not been seriously ill, although he had suffered to a slight extent from heart trouble. He had apparently been in excellent health and spirits when he left Kalamazoo Wednesday afternoon, said Judge Gordon L. Stewart, his brother. He was accompanied to Lansing by George R. Page, vice president of the firm, and Ward Brundage, mechanical engineer of the firm. He and Page were to have gone on to Detroit today. Brundage said that Mr. Stewart left the meeting near its conclusion, and remarked that he had better register to stay the night. He died in the lobby before he could sign his name. Mr. Stewart attended Kalamazoo

public schools and studied one year at Kalamazoo College. He was graduated from Massachusetts Institute of Technology, and had been in business here since that time. He was one of two surviving direct descendants of the family which became associated with Kalamazoo in its earliest days. Also surviving are two step-daughters, Maida and Natalie, two nieces, Mary and Eleanor, and a nephew, Nathaniel, all of Kalamazoo."

— JAMES W. KIDDER, *Secretary*, Room 802, 50 Oliver Street, Boston, Mass. EDWARD B. ROWE, *Assistant Secretary*, 11 Cushing Road, Wellesley Hills, Mass.

1907

Ever since September we have been trying to secure information regarding Frank R. Vanderstucken, I, from whom we have never heard directly since graduation. As the result of correspondence with Frank's mother-in-law in Pottstown, Pa., and with his brother in Andover, Mass., and more particularly due to personal efforts of Henry Martin, who has tried repeatedly to see Frank at luncheon in New York City or at his home, we are able to give somewhat incomplete facts. On March 25 Martin wrote us as follows: "I met him (Frank) accidentally in the Municipal Building this morning. He has grown fairly stout and matured, as you might naturally expect. He always was quite tall. He is working as structural steel designer under Commissioner Walter D. Binger '16 and L. C. Hammond '02, chief engineer of borough works of Manhattan (New York City). They have the West Side (elevated highway) extensions, and the new circumferential East River Drive under construction.

"In 1907 Professor Swain ['77] sent Frank to McClintic Marshall in Pottstown, Pa. After a while he established his own business in eastern Pennsylvania, but the World War and its upsets knocked the business flat. Then he was quite successful for a number of years, with headquarters in Reading, Pa., general engineering and construction business. About a year ago he came to New York due to the general poor business outlook and very recently got hooked up with Hammond, whom he knew before." Frank's residence address is 555 West 160th Street, New York City. He was married on June 2, 1909, to Daisy M. Cookerow, who died on March 12, 1933. A daughter, Virginia, born in 1912, is living.

In one of his letters Henry Martin gives this interesting information about himself: "I am busy studying all over again. Am now in my eighth course, soil mechanics and highways, plus advanced structural theory and fluid mechanics at Brooklyn Institute of Arts and Sciences. By the same token, I came in sixth with a mark of 89.43 as structural engineer, highest grade, state of New York; twelfth as sanitary engineer, department of public works; and second as city-wide assistant engineer, highest grade, out of 1,200 who took the examinations, only 10 per cent getting through at all."

THE TECHNOLOGY REVIEW

Here are three items noted in the Boston *Herald* concerning children of 1907 men: On April 17 an announcement of six M.I.T. students who were to compete that afternoon in the finals of the Stratton Prize competition, reading scientific papers before a convocation of staff and students at the Institute, included the name of Andrew P. Rebori '39 of Chicago, son of Andrew N. Rebori of our Class. — On the same day a picture of a fine looking girl bore this caption: "Miss Eunice Robinson of the New England Museum of Natural History holds what is said to be the largest amethyst in the world, valued at \$1000, at the American Gem Society conference at the Copley-Plaza yesterday." Eunice is the daughter of Winslow D. Robinson. In the rotogravure section on April 16 were several cuts showing activities of women students at Boston University School of Medicine, and in one of these was included Elsa Chaffee of Belmont, Mass., who, we are very positive, is a daughter of E. Leon Chaffee, Harvard professor of physics. — May we say right here that we will welcome and appreciate any and all clippings from newspapers or magazines pertaining to '07 men or members of their families. They provide valuable material for our class notes and for permanent records.

Typically thoughtful, Albert Wiggin, wrote us on April 4: "I noticed in the April Review that you expressed a desire to know how many of the Class were, holding public office. I have been a member of the school board at Great Falls (Montana) for the past 13 years." Albert inclosed a clipping from the April 2 edition of the *Tribune* of Great Falls, showing a picture of himself, and reading, in part: "A distinction that will turn professional politicians green with envy was achieved here Saturday by A. E. Wiggin, candidate for re-election as trustee of school district No. 1, when every one of 225 persons who voted at the annual school election marked their ballot in his favor." Our congratulations, Albert! A real tribute, indeed.

Coming, by coincidence at this same time, from the Alumni Office, is this human-interest article from the *Arrowhead*, February issue, published by Anaconda Copper Mining Club: "Mr. A. E. Wiggin, manager of reduction departments of the Anaconda Copper Mining Company in Montana, was born in Malden, Massachusetts, January 12, 1885. Mr. Wiggin was but four years of age when his father died. About two years after his father's death the family moved to the town of Wakefield, Massachusetts, and it was here that Mr. Wiggin spent his boyhood days. Wakefield he always regards as his old home town. Too young at the time of his father's death to recall much about him, he remembers with both pride and affection the efforts put forth by his mother to give him every possible advantage. During his high school and college days he earned the greater share of his expenses. He secured his first real job as clerk in a shoe store before he had graduated from short trousers. In fact, he still recalls with many a chuckle the serious

1907 Continued

arguments with his mother because his prospective employer insisted, as a condition of his employment, that he don long trousers. In September, 1903, Mr. Wiggin entered the Massachusetts Institute of Technology in Boston and in June, 1907, graduated with the degree of bachelor of science in mining and metallurgical engineering.

"During his first summer vacation after entering college, Mr. Wiggin ventured into the 'movies.' Thirty-five years ago, as many will recall, the moving picture was in its infancy — a real novelty. In casting about for a summer job he found at Paragon Park, a summer resort near Boston, a job which consisted of enticing pleasure seekers into a concession featuring the then novel movies. He still remembers the utter chagrin that he felt when greeted by friends and acquaintances while on the job. But a job was a job. He spent the summer of 1906 at Glace Bay, Nova Scotia, mining coal in the Old Dominion mine. In common with other young college men seeking experience along the lines of their chosen professions, he enjoyed a daily swim in the cold waters of Glace Bay, but recalls with what disgust the natives regarded this crazy notion of those 'Yankee college boys.' In August, 1907, Mr. Wiggin came to Great Falls. His first job here was a sampler under Carl Stamm. From this he graduated into testing work in connection with the concentrator, then in operation here, until 1912 when he was transferred to Anaconda. His work at Anaconda in connection with the remodeling of the concentrator led to his being promoted to be superintendent of concentration, having in charge both the copper and zinc concentrators at that plant. In May 1918, Mr. Wiggin returned to Great Falls as general superintendent, which position he held until May, 1929, at which time he was made manager of reduction departments in Montana, the position he now holds."

Early in April we received a fine letter from Roland H. Willcomb, 1509 Second Avenue North, Great Falls, Mont. To give you the background of this message, here are the facts: During the summer and fall of 1907, our classmate was an engineer with King Mining Company at Nome, Alaska, and then for a year and a half was assistant engineer with Boston and Montana Smelter at Great Falls. From 1909 to 1913 he engaged in private engineering practice in Idaho and Salt Lake City, then becoming assistant engineer with the United States Reclamation Service for three years, resident engineer with Sweetwater Water Company at National City, Calif., for about a year, resident engineer in San Diego, Calif., for the lower Otay Dam for two years. From 1919 to 1925 he was resident construction engineer with Montana State Highway Commission, and then became manager of the Great Falls Iron Works. Married in 1911, Roland has four daughters, ranging in age from 27 to 15.

Now for his letter: "In May, 1929, I effected the sale of the Great Falls Iron Works and remained with the new own-

ers until September. In November of the same year I accepted a position with the St. Joseph Lead Company, as superintendent of their Hughesville, Mont., properties. These consisted of a lead-zinc-silver mine and 400-ton mill. Our lead concentrates were shipped to the American Smelting and Refining smelter at East Helena, and the zinc was refined at the Anaconda Copper Mining plant here in Great Falls. An interesting fact about our zinc, although for a while quite annoying to the refinery, was the small but appreciable content of germanium. It had a tendency to build up in the zinc solution and interfere with the electrolysis. However, the ingenuity of Al's (Al Wiggin) metallurgists soon had the answer. The price of metals forced us to suspend production in September, 1930, and we continued with development work until May, 1931, when the property was shut down completely.

"The next move was back to Great Falls as division engineer for the Montana State Highway Commission. My division covered an area several times that of Massachusetts. At one time I had under way two contracts which were four hundred miles apart. The district was actually about 300 miles east and west and 200 miles north and south. Besides location, right-of-way, and labor problems, there were about 1,200 miles of completed highway to maintain and plenty of construction projects. In September, 1935, I was transferred to the main office at Helena and among several incidental assignments, served as assistant director and director of a state-wide highway-planning survey. Followed two hectic years, including three governors, and finally old man politics rang up my number.

"From November, 1937, to September, 1938, I had some intermittent employment of a consulting and reporting nature on highway problems. Last September, I was engaged by the Great Falls Housing Authority as secretary and executive director. The first chore was to make a housing survey of Great Falls, which we accomplished with the assistance of a corps of W.P.A. workers. A preliminary and partial analysis of this survey gave me sufficient data to justify an initial housing project under the provisions of the United States Housing Act. Our application for financial assistance in developing a \$750,000 project is now before the United States Housing Authority. As you probably know, this particular housing program is designed for low rents for low-income families, and is usually referred to as slum clearance. So much for business.

"None of my daughters is married. Lillian, the oldest, graduated from Stanford, after three years at Montana State College. She is now office secretary and cashier for the Great Falls Townsite Company. Just at the moment I'd say her title was cripple, as she is recovering from a sprained ankle due to excessive enthusiasm for the gentle(?) art of skiing. Mabelle, the second in the list, is now a full-fledged photographer, employed with our leading local photographer, and at

the moment in charge of the studio during the absence of the owner. She had two years at Montana State and a year at Art Center in Los Angeles. She has recovered (for this season) from her attack of the ski bug. Betty finished two years at Montana University and is now clerking in one of the local stores — practicing at cooking on the side. . . . Nancy — *l'enfant* — is in high school struggling with algebra, Latin, and a snare drum; and she says: 'That's no lie.' She is something of a dancer — you know, tap, toe, and acrobatic. She is smallest in stature but red haired and 1,000 horsepower. She's going places — but I'm no prophet.

"Outside activities? Well, I don't know what might be of interest. I have been interested in Kiwanis for many years. Was governor of this district in 1937. I still maintain my contacts with my old full-blooded friends among the Blackfeet Indians, although many of them have disappeared over the Great Divide. Once in a while I get kidded into telling some of their legends to my young friends. I am a member of the local Recreational Council. And that's about the size of it — just an ordinary dub, trying to get along and having a pretty good time doing it."

With real sorrow we record the death of Henry Alvord, which occurred on April 20. The following account appeared in the Boston *Herald* of April 21: "Prof. Henry Bissell Alvord, 53, head of the Northeastern University department of civil engineering, died of pneumonia yesterday at the Melrose Hospital after an illness of three weeks. He was treasurer of the Massachusetts Federation of Planning Boards and a member of the American Society of Civil Engineers, the Boston Society of Civil Engineers and the Society for the Promotion of Engineering Education. He was born at Montague, the son of the Rev. Henry Clay Alvord and Alice Bissell Alvord. After he was graduated from Massachusetts Institute of Technology in 1907 he became an instructor there and a few years later went to Bowdoin College to become assistant professor of surveying and drawing. He joined the Northeastern faculty in 1920 as an assistant professor of civil engineering. He leaves his widow, the former Margaret Graham; two sons, John Robert Alvord, member of the marine air corps at Pensacola, Fla., and Graham Gillette Alvord, a senior at Harvard; two daughters, the Misses Margaret Graham and Jean Ruth Alvord; and a brother, Robert Alvord of Hartford, Ct. Prof. Alvord's home was at 52 Frost avenue, Melrose, Mass." For the Class, the Secretary wrote Mrs. Alvord.

In closing, a last-minute reminder of Tech Alumni Day on June 5. By air mail, special delivery, telegram, telephone, you can even now notify the Alumni Office that you will attend — or come along anyhow. A splendid all-day program of information and recreation. Other classmates will be delighted to see you. — BRYANT NICHOLS, Secretary, 126 Charles Street, Auburndale, Mass. HAROLD S. WILSON, Assistant Secretary, Commonwealth Shoe and Leather Company, Whitman, Mass.

Plan to attend Alumni Day, June 5

1908

Karl R. Kennison has recently been promoted to chief engineer of the Metropolitan District Water Supply Commission in Boston. — Leland E. Wemple has retired from the presidency of the Illinois Zinc Company. — Walter E. Caldwell was recently elected president of the W. E. Caldwell Company, Louisville, Ky. — We have recently learned of the deaths of the following classmates, which we report with regret: Bertina Dyer Caswell (Mrs. A. O.) on January 29, 1930; Peter F. McLaughlin on October 5; and Charles L. Batchelder on January 18.

We have the following addresses to report: Harry H. Bentley, 21 Woodmont Road, Belle Haven, Alexandria, Va.; James H. Denny, 1319 East Chandler Avenue, Evansville, Ind.; Mrs. Ruth M. Denny, 236 East Broadway, Butte, Mont.; George W. Everett, 42 West Main Street, Georgetown, Mass.; Leonard S. Gerould, 1001 Ross Avenue, Wilkesburg, Pa.; Charles A. Gibbons, Jr., 30-39 83d Street, Jackson Heights, Long Island, N.Y.; William F. Grimes, 29 Clinton Street, Brooklyn, N.Y.; Robert F. Haskell, 8 Bigelow Street, Cambridge, Mass.; Arthur H. Hastings, 258 Riverside Drive, New York, N.Y.; Duncan C. Hooker, Hooker Manufacturing Company, 618 Capitol Avenue, Hartford, Conn.; Leon D. Howe, 45 Prescott Street, Clinton, Mass.; W. Armour Johnston, 120 Broadway, New York, N.Y.; Carl W. Keniston, 8 Thurlow Street, Plymouth, N.H.; Ernest E. Kilburn, Morehead City, N.C.; Harry T. McGrath, 2029 Huidekoper Place, Northwest, Washington, D.C.; J. Worth Maxwell, Apartado 4-Bis, Chihuahua Chia, Mexico; Jose Muriel, Calle Edison, 184, Mexico D.F., Mexico; Clifford H. Preston, Farmington, Maine; Leavitt W. Thurlow, 2671 San Marcos Drive, Pasadena, Calif.; Professor John Tyler, 3 Southgate Avenue, Annapolis, Md. — H. LESTON CARTER, *Secretary*, 60 Battery-march Street, Boston, Mass.

1909

Thirty-year reunion, June 3 to 5, Oyster Harbors Club, Osterville, Cape Cod. — From Delos G. Haynes comes this interesting letter of a recent trip to Yucatán: "After a strenuous patent-infringement trial in Louisiana in February, Mrs. Haynes joined me for a trip we had long wanted to take, to Chichen Itzá. We sailed on the only boat running to Yucatán from New Orleans, the slow-moving, friendly, comfortable Norwegian freighter, *Bertha Brovig*. *Bertha* sails empty southbound and brings back sisal from Yucatán and occasionally chicle from farther west. *Bertha's* schedule is timeless. She goes when and where the cargo beckons, and her passengers (12 the maximum) learn to like it. The leisurely trip was a good introduction to the mañana-land of Yucatán today but heightened our amazement when we saw the monuments of the magnificent civilization that flourished there during the Dark Ages of Europe.

"From the pink-and-white seaport, Progreso, on the flat Gulf Coast we drove inland past about 20 miles of sisal to Mérida, the capital, with its windmill for every family; then 50 miles in one direction to the ancient Mayan city of Uxmal; then 80 miles in another direction from Mérida to Chichen Itzá. Except for the sisal plantations along the wood-burning railway, and the Mayan corn, the jungle was ever present, gray and brown (there had not been rain for months), and so tangled that it was impassable even for a few feet except with the aid of natives and their trusty machetes.

"We were dinner guests of Dr. and Mrs. Morley of the Carnegie Institution at their hacienda near Chichen Itzá. Vannevar Bush '16 and Mrs. Bush had been there a few weeks earlier. If you ever have an opportunity, be sure to hear Dr. Morley speak on his favorite subject of Mayaland, to which he has devoted many years of study. His experiences in Yucatán make a story that is stranger than fiction. His delightful, modest way of telling what happens, if put in a book, would fascinate any young student, not to mention older people, and would convince any reader that archeology and cognate studies are full of thrills. When I pleaded with him to write such a book, he smiled and told us of the serious scientific books he must write first.

"I will not attempt to describe the marvels of the architecture and the sculpture, nor the enigmatic glyphs that even Dr. Morley has only partly deciphered, nor the legends of the Sacred Well, nor the dozens of mounds covered with tangled jungle growths and only a statue or a wall jutting out to suggest ancient secrets hidden beneath, nor the friendly, white-clothed Mayan Indians living just as they did when the Spaniards came 400 years ago, nor the iguanas, nor the armadillos o-dilloing in their armor. Though Yucatán is just across the Gulf, we felt farther away from home than we ever had in Europe. We are going again!"

At the annual meeting of the Boston Society of Civil Engineers, held in March, Arthur L. Shaw was elected vice-president and Charles R. Main, re-elected treasurer. The Boston Society is the oldest engineering society in the country, having been organized in July, 1848. — A recent textile trade paper carried the announcement that the Nashawena Mill B in New Bedford had been sold to the Acushnet Process Company, manufacturers of molded rubber products, who plan to use it for additional manufacturing space to provide for expansion of operations now in contemplation. Apparently business is good with Cy Young! — CHARLES R. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass. *Assistant Secretaries*: PAUL M. WISWALL, MAURICE R. SCHARFF, New York; GEORGE E. WALLIS, Chicago.

1910

Last month after receiving a notice from Charles A. Robb that he had received a degree of doctor of engineering

from Johns Hopkins University, your Secretary wrote him that he would like to have a story of his experiences since he left Technology. On the day after the notes for the last Review had been sent in, the following letter arrived: "Your kind letter of March 2 has brought a flood of happy memories of the Institute, classmates, high endeavors, and wonderful times in Boston. I would much rather have you at my hearth to talk of old wood, old books, and old friends than to scribble of my doings as you request. After qualifying for my master's degree in Course II in 1910, Stan Smith, VI, and I had a year with Allis-Chalmers at Milwaukee. I was assistant in mechanical engineering at the Institute for a year and then came to the University of Alberta in 1912 as a lecturer. I was superintendent of gauge production, Imperial Munitions Board, Ottawa, from 1916 to 1917, and was technical assistant to the United States representative, Imperial Munitions Board, Washington, D.C., from 1917 to 1918. I returned to the university in 1919, and from 1920 to 1925 I conducted research on 'Operation of Aero-Engines at Low Temperatures' for R.C.A.F. I have been a professor of mechanical engineering since 1921, and in 1931-1932 spent my sabbatical year as graduate student at the Johns Hopkins University under Professor A. G. Christer on the engineering of steam power plants and, for research, 'Recompression Phenomena in Steam Nozzles,' not yet published; obtained doctor of engineering in 1938. I am a member of the Association of Professional Engineers (past president), Engineering Institute of Canada, American Society of Mechanical Engineers, Institution of Mechanical Engineers [England], Sigma Xi (1932), Rotary Club of Edmonton, and Mayfair Golf and Country Club. Married Edna May Sleer of Hamilton, Ontario, on September 21, 1921. We have three children: Mary, Gordon, and Helen, 13 to 16 years. . . ."

Dud Clapp has been in Newark, N.J., where he visited Richard Bicknell. Bicknell manufactures porcelain for radio insulators. Aside from his business, he has formed the Monmouth County Technology Club, and, together with the founder of the Club, two other classmates, Helen Fales and Frank Hays, are also members. Dick took Dud over to the Wallace and Tiernan Company's plant, which is near by, and he met Martin Tiernan, who is president of this company. — HERBERT S. CLEVERDON, *Secretary*, 46 Cornhill, Boston, Mass.

1911

These notes will appear just before that day "when good fellows get together" — Alumni Day, June 5. If you have not already so planned, right now make every effort to comply with that "Take Me Back to Tech" urge and plan to spend at least a part of that day and evening with your classmates and fellow Alumni at this glorious home-coming. See you there! Twenty-eight — yes, sir, that's what we are this June: 28 years out of Tech. How tempus fugit! Early this month

1911 Continued

(April) I was the dinner guest of the dormitory freshmen, and in speaking to them I inadvertently remarked that it was 31 years ago that I was in the same relative position as they were. You know that extra three years sounds like an awful lot more, so I vowed to myself then and there that any future references I made in public would be to the year of graduation and not to earlier periods.

The last word I had from Berkeley, Calif., concerning Mary Barker, Charlie's widow, was that she is still hospitalized and probably will be so confined until midsummer or later. She was terribly injured and badly lacerated and bruised in that March 14 automobile accident which resulted in Charlie's death the next day, and it was not until two weeks later that the physicians advised her of her husband's death. One of them wrote me: "Personally I am inclined to believe that now she knows the truth she will fight all the more for recovery because of her two boys, 12 and nine." You know my first word of Charlie's death came in a telegram from Bert Fryer, VI, whom I hadn't seen or heard from since our 1921 reunion. Bert and Charlie, B. Darrow, and I were very close in Course VI and Barker's death came pretty close to them as to me. Fryer is located at 528 32d Avenue, South, Seattle, Wash., operating as a lumber-drying engineer, and in a subsequent letter, inclosing further details, he said that he and his wife had rather expected the Barkers to spend part of the summer with them "as we have a summer place on the Canal that would be fine for the two boys." "I suppose it just had to be," he continues, "and that Charlie had his number up that day, but I know a lot of others that should have been tagged instead of him. It just does not seem right, but I guess God has peculiar ways of operating that we do not know about. Am glad to hear that you and your family are all well and I can say the same. Both of mine are now married, and the son got through the university here a couple of years ago and now is with American Can Company. I am trying to get East this summer, in which case will look you up."

A nice letter at hand from George Watson, IV, who for years operated the Watson Company in Dallas, Texas, but now is vice-president and general manager of McEvoy Company, Houston, Texas. "McEvoy Company," he writes, "is an old concern manufacturing high-grade equipment for oil-well completions in the heart of the oil country, and we have ambitious hopes for a bright future. All my girls are boys. The last three, before they were born, were called 'Mary Jane.' Two of the oldest are in business with me in Houston, one in the building business and one helping me manufacture oil-field equipment. Bobby enters college next year, and Tommy, the youngest, is only 13. I wish we were closer together so that we could all be better acquainted. Our new catalogue is due and you will get a copy."—Tom Haines, II, and his wife announce the marriage of their daughter, Marjorie, to Leonard Gage James of New

York City on Saturday, April 22, at Saint Bartholomew's Church in the Big Town. Following a honeymoon trip, the young couple will be at home after June 1 at 78-12 Thirty-fifth Avenue, Jackson Heights, Long Island, N.Y. Our collective good wishes to the young couple!—Remember Sam Blum, VI? He has for years been with the engineering division of the water service department, City of Boston, at City Hall Annex in the Hub, but has never forsaken his real interest in music. He has operated an orchestra for a number of years and now you see him billed as "Sam Blum, directing New England's finest old-time band."

If you go to New York now and it seems as if the lights weren't quite so bright on the Great White Way, charge it up to the brilliance lost through the departure of one of the Big City's middle-aged benedicts, until recently man about town, who has been transferred to Pennsylvania. Yowsar, we learn that Pete White, II, is now to be addressed care of the Babcock and Wilcox Tube Company, Beaver Falls, Pa. We also learn that Karl Kilborn, II, has returned from Wiltshire, England, and is now at 2440 West Market Street, Akron, Ohio; Fred Adams, XIII, has left New London, Conn., for 253 Cumberland Street, Brooklyn, N.Y.; and as an offset to the latter change, Mert Hopkins, I, has answered the "back to nature" urge and deserted Manhattan for Old Greenwich, Conn. That's all for now, mates, but I hope to see a lot of you at Alumni Day, June 5—yes, it's a Monday, convenient to include in a long weekend—and for those of you who cannot attend, remember Uncle Sam still delivers letters promptly, and I love to hear from you!—ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Worcester, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

1912

We regret that we have to announce the deaths of two classmates. Justus C. Sanburn, X, technical director and Secretary of the Strathmore Paper Company, died in his home at 33 Oxford Road, Longmeadow, Mass., on January 15, after a brief illness. He was born in Thomson, Ill., on June 4, 1890, the son of Willis H. and Maud Rising Sanburn. Graduated from the M.I.T. in 1912, he immediately entered the Strathmore organization and rose gradually to his executive office. Mr. Sanburn made a number of valuable contributions to the paper industry. He devised one of the first accurate methods of fiber counting and cooperated with the Bureau of Standards in establishing weight factors for use in fiber analysis standards. His thesis was written on water analysis; he early recognized the importance of water variables in the manufacture of paper. He originated, and put into use, color standards made from an extract of oak leaves. He recognized the importance of the pH test, and used a comparator with indicator standards in sealed glass tubes some time before such commercial instruments were on the market.

Sanburn saw the potential values of titanium oxide when that compound was a laboratory curiosity, at \$16 a pound. In 1931, when its price had dropped to 20 cents, he was ready to use it, with the result that Strathmore was the first mill to employ that material as an opacifying agent. With the increasing demand for opaque printing papers came the need for a simple, quick method of measuring opacity. For an opacimeter he adapted the Weston sight meter, finding by tests that there existed a nearly straight-line ratio between foot-candle readings and the per cent of opacity by contrast ratio of white papers. Sanburn leaves his widow, Mrs. Marion Hale Sanburn; a son, Willis H., a sophomore at Yale University; a daughter, Eleanor H., a student at the Emma Willard School; and his mother, Mrs. Willis H. Sanburn of Springfield.

Bancroft Winsor, II, of Flying Cloud Farm, Inc., Acushnet, Mass., nationally known as a grower and exhibitor of gladioli and peonies, died on April 8 at the Baptist Hospital of New England, Boston, in his 49th year. He had been ill a comparatively short time, having entered the hospital on the sixth. Mr. Winsor was born June 26, 1889, in Fairhaven, son of Mary Bancroft and Walter Pellington Winsor, and was educated in the Fairhaven schools. He married Miss Beatrice L. Dunham of Fairhaven, June 26, 1913. As a young man, Mr. Winsor was a fancier of dogs, pigeons, and poultry. He owned a large string of prize-winning foxhounds, which he valued as protection for his poultry as well as for the sport they afforded. Eventually these earlier interests were superseded by horticulture and development of his apple orchards, which were a hobby as well as a business.

Mr. Winsor was a trustee of the New England Gladiolus Society, exhibited his flowers at all the major shows, and won numerous first-prize awards. Survivors are his widow; a daughter, Mrs. Sylvia Moseley, who was associated with him in his gladiolus growing; a son, Philip A. Winsor; and two grandchildren, Philip A., Jr., and Ann Karen Winsor, all of Acushnet; a brother, Dr. Allen P. Winsor of Brookline; a sister, Mrs. Carl C. Shippee of Red Bank, N.J.; and an aunt, Miss Anne Bancroft of Boston and Salters Point, South Dartmouth, Mass.

Your Assistant Secretary reports a pleasant visit with David F. Benbow, II, of Reading, Pa., who was in New York recently. Benbow had stopped in at the McGraw-Hill Building to buy some books (excuse the advertisement, please) and remembered that the Class maintains an Assistant Secretary there, so he looked in on us, thereby furnishing us with at least these few lines for the notes.—Elliot W. Tarr, VI, reports that he has cut loose from his former business interests in Gloucester, Mass., and has taken a position as chief engineer of the Peter Bent Brigham Hospital in Boston. "I shall still maintain my home in Gloucester until October," he writes, "and after that I will probably have a Boston address. Meanwhile the address 81 Western

Plan to attend Alumni Day, June 5

1912 Continued

Avenue, Gloucester, is O.K., or you can reach me at the hospital, 721 Huntington Avenue, Boston. Kindest personal regards to yourself and any of the 1912 men whom you may happen to contact."

The M.I.T. Club of Northern New Jersey held its annual meeting and banquet at the Newark Athletic Club, Thursday, April 20, with a magnificent turnout of Alumni living in this vicinity. Our own Class didn't do anything to boast about, but there were four of us there, sharing a table with five members of 1911. Our four were Harold H. Griffin, II, Henry W. Coddington, VI, Harold H. Brackett, VI, and David J. McGrath, I. Coddington, who has been in electrical engineering with the Public Service Company of New Jersey practically ever since graduation, has two grown-up daughters, both away at college in the Middle West. We heard and enjoyed Dick Ranger's sound-effect records, made in the halls and laboratories at the Institute, but the high spot of the evening was Dr. Compton's talk and lantern slides featuring what's new at the school on the Charles. — FREDERICK J. SHEPARD, JR., Secretary, 125 Walnut Street, Watertown, Mass. DAVID J. McGRATH, Assistant Secretary, McGraw-Hill Publishing Company, Inc., 330 West 42d Street, New York, N.Y.

1913

In late April, Fred Murdock called me (Hap Peck) on the phone and asked me to write something for this issue of the class notes as he was unable to do so. The cause of Fred's inability is his undergoing a serious operation for gallstones. I am delighted to report that the operation was successful and the patient is making a splendid recovery. Latest reports (April) are that he is very cranky, which in other words means a substantial return to normal. He expected to be in the hospital a couple of weeks and then take a like period of convalescence at home. There is no reason to anticipate any difficulty, and I know I voice the feeling of our classmates when I say that we wish Fred every possible success from his operation.

I see Jim Russell at least every other week when a small group of us get together for an evening at cards. Jim is in fine shape and putting on more weight every day. — Early this year Ding Pinnock and his wife spent a week-end with us at Sharon, and on Saturday evening Bill Brewster and his wife and Jim Russell and his wife joined us. Ding and Mrs. Pinnock suffered the loss of their daughter last summer after a very brief illness. They have a very fine son, and, although I did not know their daughter, I understand she must have been an unusual and outstanding young lady. — Bill Brewster is now the treasurer of the Plymouth Cordage Company, and that title in the textile industry means the big boss. Bill is getting fat also, which, incidentally, seems to be a growing characteristic of all of our classmates. — I had a note from Jack Farwell in New York recently, and he had the audacity to send me another

of those engraved announcements which were broadcast to the multitude when he had to move from some place on the Bowery to Harlem, I think it was. We are asking the Alumni Office to furnish Jack's correct address in case any of his classmates have occasion to serve any process upon him: 108 East 38th Street, New York City.

I have no other class news, but I do have a very definite suggestion to all: That is that this will be a splendid time for any '13 man to write Fred Murdock a letter. He will not only be most pleased to receive it but he will also be glad to use it in future class notes. — FREDERICK D. MURDOCK, Secretary, Murdock Webbing Company, Box 784, Pawtucket, R.I.

1914

Reunion issue! This copy of The Review should be received just at the zero hour, and as a final challenge you are warned that if you are not in Swampscott on June 3, you will have missed the one and only 25th you will ever know. Special space being reserved for latecomers, and extra covers available at the Saturday night dinner for all friends and honorary members of the Class.

At the Tech Club in New York on the evening of April 6 Charlie Fiske put on one of his renowned dinners for local — and not so local — '14 men. Dinny Chatfield came down from Hartford and told a bit about aircraft design trends. George Whitwell took a bow for rushing up from Philadelphia just for the dinner and then hurrying back so as to be in time for a dance he was giving for his daughter. Art Peaslee, also down from Hartford, was on hand to prepare for his position as official greeter at the coming reunion. Captain Richey gave a thrilling account of naval construction. Your Secretary told a bit of the reunion and Alumni Day plans as viewed from the Boston angle. Others attending were Mayo, Chet Gardner, Dickson, who as chairman of the reunion was full of plans for every detail, O. C. Hall, Russell, Simpson, Ober, Duffield, McMenimen, Fox, Somerby, Owen, Spitz, Affel, Warren, Aldrich, and the one and only Charlie Fiske.

A note was received from President Dorrance that he had to cancel his trip from Philadelphia because of doctor's orders. Your Secretary was in Philadelphia the following day and learned with great regret from Mrs. Dorrance that Buck certainly did have doctor's orders not to go to New York. He was confined to bed with a heavy case of grippe, and as these notes are being written two weeks later it is understood that Buck has not yet been able to return to his office. Tough luck, Buck, but the Swampscott salt air will help a lot.

Your Secretary recently spoke before the Technology Club of Central Pennsylvania at Harrisburg, and was happy to see Cliff Walton there, looking as cheerful and rugged as ever. Cliff has been with the Bell Telephone Company of Pennsylvania ever since graduation. — A recent event

of naval importance at Boston was the launching of the airplane carrier *Wasp*. Captain Richey was detailed from the Brooklyn Navy Yard to be present and assist in the launching, on which activity he is understood to be one of the Navy's authorities. Following the launching your Secretary had the pleasure of accompanying Captain Richey to New York and later being shown by him the construction activities at the Brooklyn Navy Yard, where Captain Richey is in charge of construction and repair. Only a visit to the yard is adequate to describe the responsibilities of that position: thousands of men busily at work, capital ships on the ways, others in dry dock, teeming activity everywhere. And Captain Richey's name appears there on a short roster of men who have held this important post in about 100 years. — H. B. RICHMOND, Secretary, General Radio Company, 30 State Street, Cambridge, Mass. CHARLES P. FISKE, Assistant Secretary, 1775 Broadway, New York, N.Y.

1915

Don't forget the class cocktail party at the Hotel Statler, Boston, Monday, June 5, from four to seven o'clock. This is free to all classmates and their guests, including ladies. And we extend a cordial welcome to all the ladies to come and enjoy our party.

It's been a long time since there has been a request for class dues. Being class secretary and treasurer is no easy job, and dues collecting is one of the toughest tasks I have to do. You can all help by sending me your check promptly. Come on, give the Class your support. The dues are only \$2.00, but of course you can send anything more that you want. And, remember, whatever you do will "Help Azel." — AZEL W. MACK, Secretary, 40 St. Paul Street, Brookline, Mass.

1916

Twenty-seven classmates attended a special luncheon tendered by Bob Wilson, X, at the Technology Club of New York at noon on March 29. This luncheon was held to start a real boom for our 25th reunion in 1941. President Farthing appointed a committee — Bill Kniesner, chairman, Bill Barrett, and Walt Binger — to start the wheels in motion for several luncheons and dinners before 1941. Steve Brophy was present, and he warns that we are soon to hear from the reunion publicity committee. Each man present was asked to introduce himself, state what he was doing, and tell a story. We report the following: Bill Farthing, R.F.C.; Bill Barrett, Metropolitan Life Insurance Company; Walter Binger, commissioner, Department of Borough Works, New York City; Steve Brophy, Kenyon and Eckhardt, Inc.; Bob Burnap, R.C.A. Radiotron Company, Inc.; Fat Clarke, Bell Telephone Laboratories, Inc.; R. V. Davies, Aluminum Company of America; Harold Dodge, Bell Telephone Laboratories, Inc.; Jim Evans, Johns-Manville Corporation; Joe Farhi, Consolidated Edison Company of New York, Inc.; R. C. Fellows, General Cable

1916 Continued

Corporation; R. E. Hefler, Joseph F. Burke; Frankie Hubbard, Brewster Aeronautical Corporation; Bill Kniesner, patent attorney; R. G. Knowland, Bigelow-Sanford Carpet Company, Inc.; George Maverick, Standard Oil Development Company; Joe Meigs, patent attorney; Bob Naumburg, Jonas and Naumburg Corporation; H. B. Smith, Underwriters Laboratories; E. C. Pitman, E. I. du Pont de Nemours and Company; Bob Wilson, Pan American Petroleum and Transport Company; Dutch Gaus, Gardner-Denver Company; and L. W. Wilson, architect. Henry Hunter and Joe Barker were expected but unfortunately couldn't make it. All voted the luncheon a success, and Bob Wilson, the host, was given a rising vote of thanks for the enthusiasm he has placed behind our class activity and for his generosity.

I. B. McDaniel was recently transferred from the New Federal Building at Atlanta, Ga., to the United States Navy Yard, Washington, D.C. Incidentally, one of his new bosses will be Harold E. Saunders, who was recently selected for captain and is in charge of the experimental work at the model basin. — Bill Brown writes from Nela Park at Cleveland: "If you are still thirsty for class news for *The Review* — I happen to be director of the secretariat on lighting practice for the International Commission on Illumination, and if the gentlemen in Europe will just quiet down a bit for a few months, I shall be leaving for Europe the end of May to present the report on lighting practice at the I.C.I. meeting in Holland in June. It's at Scheveningen, which I guess is not such a bad spot at that. Incidentally, a short time ago I was promoted to the rank of commander in the Naval Reserve, in which I am still active."

Our good friend and classmate, Ralph Millis, I, died on November 11 at Wilmington, N. C. Ralph will always be remembered by his associates in Course I as a very happy, cheerful, and congenial member of our Class. At the time of his death he was district engineer for the United States Army at Wilmington. He was a major in the Corps of Engineers, a member of the American Society of Civil Engineers, the Society of American Military Engineers, the University Club of New York, the Century Club of Panama City, the Carolina Yacht Club, and an honorary member of the Wilmington Chamber of Commerce. In June, 1937, he was president of the Wilmington Rotary Club. Besides his wife, he leaves two daughters. — JAMES A. BURBANK, *Secretary*, The Travelers Insurance Company, Hartford, Conn. STEVEN R. BERKE, *Associate Secretary*, Coleman Brothers Corporation, 245 State Street, Boston, Mass.

1917

Edward P. Warner was appointed in April to be a member of the Civil Aeronautics Authority for the remainder of the term expiring December 31, 1940. He will succeed Edward J. Noble, who has become an assistant to Secretary of Commerce Hopkins. It will be remem-

bered that Warner served in the Institute's Course in Aeronautical Engineering from 1920 to 1929 and as assistant secretary of the Navy from 1929 to 1933. He has served recently as economic and technical advisor to the Aeronautics Authority.

The subject of "Washburn's Weekly" column in the *Boston Evening Transcript* of February 27 was the mayor of Springfield, Roger Lowell Putnam. To one not well versed in Massachusetts politics it would seem that Roger was the recipient of something of a build-up, in reverse, for his alleged political aspirations for the lieutenant governorship. — In a note to Ted Bernard late in March, Bob Marlow reported that he had been seriously ill but was then on the road to recovery. He reported further that Erling Stockmann had been made executive assistant to the vice-chairman of the board of the Consolidated Edison Company of New York, Inc., and that it was rumored that Erling would be in charge of that company's exhibit at the World's Fair in New York. Bob sent regards to "all of the boys" and added: "Let them know that a tough guy can't be made to stay down." — Dick Loengard reports that he is busy trying to increase the use of chromium plating, as well as Electrolux. Dick had recently talked with Ken Lane at the Wright Aeronautical Corporation. Ken was off to Europe the next week. (The Assistant Secretary would like to inquire parenthetically if Ken ever stays aground or ashore long enough to answer his letters.)

Under date of March 23 Sherry O'Brien wrote to Ted in part: "Inasmuch as the Club Secretary will send in a complete account of the dinner (Technology Club of Chicago) I will just give you a few high lights concerning members of the Class. Penn Brooks was elected president of the Club for the ensuing year, as perhaps you know. The following members of the Class were at the dinner, if my memory does not fail me: Penn Brooks, George Doherty, Louis Ferguson, Jr., Paul Flagg, Bill Seymour, Nelson Works, and Alvah Moody. Rad Stevens was called away at the last minute and Dick Whitney (more formally known as R. Thompson) was held in New York longer than he expected; he even tried to make a plane to get to the dinner but missed it. Al Moody has been transferred to Chicago and is with Keasbey and Mattison." It should be added that Sherry is chairman of the executive committee of the Chicago Club. With such a 1917 team in the saddle the coming year should be a good one in Chicago. — Lin Noyes is a director of the American Newspaper Publishers Association. He has been in Florida for part of the winter and at this writing (April) is in attendance at the Associated Press Convention in New York. — Irving McDaniel has been transferred to the Washington Navy Yard as of June 1, and when seen by a roving correspondent in Atlanta early in April, he was about to start on a trip to Texas and way stations on official business but was feeling somewhat sad at the prospect of leaving the South.

Frederick Ohrt, chief engineer and manager of the board of water supply of Honolulu, addressed a luncheon meeting of the Engineering Association of Hawaii early in March on the general subject of an employee's classification system. — Frank Maguire has recently been made manager of industrial development of Reichhold Chemicals, Inc., and should be addressed at 726 Rockefeller Street, Elizabeth, N.J. — Bob Gay of the Texas Backlash Associates, Ltd., writing from Houston, Texas, indicates that he is busy inventing some "tall fish stories," the same to be substantiated by pictures. At this writing the class files are still in a state of expectancy as to the pictures. — A note has come in from Dean Parker in which he says that his boy is considering seriously a career in naval architecture and that he will be ready for college the year after next. Dean reports also that he has recently heard from Fritz Althouse who had been on an extended business trip in western Canada.

Barney Dodge writing to Ted Bernard in March says: "Generally I scarcely make contact with as much as one member of the Class per year on the average, but this year I have done better than this. Only last week John Holton was in town with his son, John, Jr., who is preparing to enter college this coming fall. I spent a morning showing them around our brain factory here. In the evening they were out to the house for dinner and were entertained (perhaps bored is the word) mostly by moving pictures showing the wanderings of the Dodge family in Europe and in the national parks of the West. John is with the Pulp Products Company of Massillon, Ohio. They are developing a paper container for oil, and John showed me several samples which looked promising — at least to one who doesn't know anything about it. He has been with this company about two years I think, having previously been with the Carrier Corporation. I was struck by the fact that the years have dealt very lightly with John. . . . Last fall at the Philadelphia meeting of the American Institute of Chemical Engineers there was quite a reunion of '17 men: Walt Whitman, Bill McAdams, Dave Pierce, Ken Bell, and myself. There may have been a few others whom I don't recall at the moment. I have seen Frank Howard, now in charge of chemical engineering at Worcester Tech, at these meetings, but I don't think he was there last fall. About a year ago I went to Rochester to address the local section of the American Chemical Society and I was met at the station and escorted to the lecture room by Leon McGrady. Leon was even so kind as to remain throughout the course of my talk, which he must have found not a little boring. What truer mark of friendship could one ask than that! My conscience still troubles me to think that I was the cause, however innocent, of such a sacrifice on the altar of friendship. Although Johnny De Bell is not now so far from New Haven, my only contact with him has been a vicarious one. One of my students went with Monsanto last summer

Plan to attend Alumni Day, June 5

1917 Continued

and was assigned to the plastics division at Indian Orchard, near Springfield, where John is either director of development or something equally important. When the student was back at New Haven this fall, he stopped at the laboratory just long enough to say that John had sent his regards. I commissioned him to take mine back. Next time I hope we can dispense with the middleman, so to speak. This about exhausts my slender stock of news about members of the Class. I have little to say for myself. My chief reminder of advancing age is that my son will be ready for college a year from this fall, and I have to confess that I have apparently not been very successful as a salesman for my alma mater, as he seems to think he wants to go to Yale." — May more of you take a page from Barney's book and write your Secretaries of your activities and contacts. — RAYMOND STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass. PHILIP E. HULBURD, *Assistant Secretary*, Phillips Exeter Academy, Exeter, N.H.

1918

I wish it were possible to reproduce pictures in these notes. If such a thing could be done, I certainly would include a picture of our old friend Donald B. Parkinson, clipped from the brown section of the paper put out by the Automobile Club of Southern California, and under it is the following notation: "Rides His Hobby — Tinkering with cars to see how they're made and how well they'll perform is a source of fun and recreation for D.B.P., noted Southland architect and 18 years a Club member. Here he is at the wheel of the French Bugatti (and it sure looks like a bug — Secretary's addition) sports racer he recently purchased from a British concern. This little car is a standard two-place racing model with a large 8-cylinder motor that develops 150 horsepower and is capable of a speed of 130 miles per hour. The supercharged motor, operating on roller bearings, is bolted to the chassis. The machine is equipped with 4-wheel brakes, racing tires, and a fuel tank with a capacity of 32 gallons of gasoline." Somebody before sending this to me added "'18 but still a freshman at heart." — Another set of pictures I would reproduce would be those of the interior and exterior of Maggie's camp in Jaffrey, N.H. As I have told you before, he did send me the article from the *Troubadour* which came out just before Christmas. — The third pictures would interest particularly those of us who were at the 20th reunion last June. On my return from spring vacation about April 1, I found awaiting me the folder from George F. Grandi, manager of the Weekapaug Inn, 2d, saying that it would open for the 41st season on Thursday, June 29. In the folder is a copy of the architect's drawing of the east elevation for the new inn. Following is a description of the new inn: "Located on safe land, the new building is well equipped with private baths. From the piazzas, living rooms, and guest rooms an intimate view of ocean and pond is obtained, and the

bathing beach is less than 1,000 feet by walk or road along the edge of the cove. Bathing facilities are provided adjacent to the beach. Sailing, rowing, and tennis are featured as formerly." This looks as though there would be a possibility of our gathering again in another ten years in our old haunts. Sometime on my way up to Boston I will go the long outside road and take a glimpse of the new inn.

During the months of July and August your Secretary is going to be wandering through the Middle and Far West, so please do not be surprised if you should get word that she is in your vicinity. She has made no definite plans as to route, but she knows that she will be around Chicago for two or three days before going west to Utah and possibly the Coast.

The following are some of the addresses that have come through from the Alumni Office recently: Myron W. Adams, Modular Service Association, 110 Arlington Street, Boston, Mass.; John C. Braislin, 15 Woodside Circle, Hartford, Conn.; Benjamin P. Cohen, 1213 Meigs Street, Augusta, Ga.; Francis G. D'Arcy, 53 Newell Avenue, Southbridge, Mass.; Allen F. Drake, 10 Lockwood Street, Edgewood, R.I.; Herbert A. Dyer, 14114 Grandmont Road, Detroit, Mich.; Alfred R. Evans, 39 High Street, Milford, Conn.; William P. Fisher, Jr., Du Pont Company, 2100 Elston Avenue, Chicago, Ill.; Irving G. Hall, Jr., Chelmsford Road, Bedford, Mass.; Dr. Clarence D. Hart, City Hall, Savannah, Ga.; Edward W. Hellier, 15 Marlborough Street, Boston, Mass.; Masaki Ito, 1 Icchome Zosigaya-Mati, Tosima-Ku, Tokyo, Japan; Asher W. Joslin, 66 La Salle Avenue, Rye, N.Y.; Captain Ola A. Nelson, Fort Amador, Canal Zone; Meredith F. Parker, 32 Myrtle Avenue, Long Branch, N.J.; Alfred N. Pray, City Recorder's Office, Los Angeles, Calif.; Roy Wanser, 600 West 113th Street, New York, N.Y.; Amory L. Williams, 1087 Elizabeth Street, Pasadena, Calif.; and William Wyer, University Club, 3813 Euclid Avenue, Cleveland, Ohio.

If news doesn't come to me soon, I may have to resort to what our friend Maggie said he would do if people didn't send him in notes for the "Repeal of the Eighteenth Amendment." Be careful! — GRETCHEN A. PALMER, *Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

1919

The Class held a dinner on the evening of April 19 at the Winthrop Hotel in New York City; 17 men attended. The purpose of the dinner was to discuss plans for the 20-year reunion. It was decided that the Class would have their reunion on June 2, 3, and 4 in the vicinity of Boston rather than in New York or at some intermediate point between Boston and New York. With the exception of a few uncertain ones, everyone present indicated that he would be able to attend this reunion. Eugene R. Smoley, Wilfred O. Langille, and George W. McCreery were given the responsibility of seeing that the class notes appear in *The Review*.

Those present at the dinner were: Alexis R. Wiren, Technology Club, 24 East 39th Street, New York City; Ralph H. Gilbert, 238 East 31st Street, Brooklyn, N.Y.; Karl F. Rodgers, Bell Telephone Laboratories, 463 West Street, New York City; Theodore Shedlovsky, scientific research (physical chemist), Rockefeller Institute for Medical Research, York Avenue and 66th Street, New York City; Wilfred O. Langille, Diehl Manufacturing Company, Elizabethport, N.J.; Ellsworth G. D. Paterson, Bell Telephone Laboratories, Inc., New York City; Henry A. de Bonneval, Ansonia Clock Company, 420 Lexington Avenue, New York City; Frederick J. Given, 463 West Street, New York City, telephone engineer, Bell Telephone Laboratories; Eugene R. Smoley, sales engineer, The Lummus Company, Graybar Building, New York City; Donald D. Way, Diehl Manufacturing Company, Elizabethport, N.J.; Herbert W. Best, Yale University, New Haven, Conn.; Cutter P. Davis, manager of Winfield H. Smith Company, manufacturers of speed reducers, Springville, Erie County, N.Y.; Timothy E. Shea, switching development engineer, Bell Telephone Laboratories, Inc., New York City; Thomas L. Goodwin, Jr., 4022 Lawrence Street, Flushing, N.Y.; Oscar A. de Lima, 55 River Street, Stamford, Conn.; Charles J. Farist, The Ball and Socket Manufacturing Company, West Cheshire, Conn.; Myles F. Connors, Woolworth Building, New York City. Regrets were received from Jack Meader, Jim Strobridge, Howard McClintic, Jr., Elisabeth Coit, and Amos Prescott.

Donald D. Way, Class President, called the meeting to order and is making the necessary arrangements for the class reunion. After the dinner some of the group went over to the Technology Club at 24 East 39th Street. This column will be printed immediately before the reunion, so it will be too late to be used for publicity purposes. We expect a good attendance at this reunion, and the report of its success will follow. — *Review Secretaries*: EUGENE R. SMOLEY, 2 Fairmount Avenue, Hastings-on-Hudson, N.Y.; WILFRED O. LANGILLE, Diehl Manufacturing Company, Elizabethport, N.J.; GEORGE W. MCCREERY, 275 Cypress Street, Newton Center, Mass.

1921

Alumni Day is just a few days hence on June 5. Warrie Norton's committee has arranged an unusually fine program, and we ought to show him our appreciation and have a good time doing it by turning out in large numbers. Better pack the extra toothbrush, and head for Cambridge now. Incidentally, because of, or in spite of, our electioneering, Warrie was elected to serve for two years as vice-president of the Alumni Association as a result of the April balloting. — From the *VI-A News* for March: "The third recent visitor was Ralph M. Shaw who was here on business. He was looking for a New England representative (VI-A graduate preferred) for the Pedrick Tool & Machine Co. of Philadelphia, of which he is

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president. This company specializes in pipe bending machinery." R. V.'s Nos. 1 and 2 were George Chutter and Dug Jackson as reported in these columns.

Congratulations and best wishes to William Rose, Jr., IV, on his elevation to the general managership of the 63-year-old Christian Feigenspan Brewing Company, 50 Freeman Street, Newark, N.J. Bill's company is nationally renowned as the purveyor of P.O.N. beer and ale, particularly well known to Tech men hereabouts. — Asher Cohen, X, is now with the Olson Preservative and Paint Corporation, 9 Delancy Street, Newark, N.J., manufacturing chemists who specialize in paints for boat bottoms, decks, and topsides.

At the April 20 banquet of the M.I.T. Club of Northern New Jersey, Maxwell K. Burckett, VI, was reelected treasurer and Sumner Hayward, X, was elected a regional chairman. Besides these two from the Class, our group at the meeting included: George Chutter, Asher Cohen, Sanford Hill (who came all the way from Wilmington, Del.), Fred Kowarsky, Ed Lockwood, Joe Wenick, Ralph Wetsten, and Cac Clarke.

New locations for the following members of the Class are presently reported: Axel G. H. Andersen, III, 34 Remsen Street, Brooklyn, N.Y.; Roger Clapp, I, 17 Thorndike Street, Palmer, Mass.; Adolph G. Denbin, VI, 406 Equitable Building, Baltimore, Md.; Louis B. Dennett, XV, E. I. du Pont de Nemours, Buenos Aires, Argentina, S.A.; Edward S. Dennison, II, 527 Alewife Parkway, New London, Conn.; James H. Dodge, I, 256 Washington Street, Dover, N.H.; Lieutenant Commander Glenn H. Easton, XIII-A, United States Maritime Commission, Washington, D.C.; Willard A. Emery, II, 163 Ridge Road, Rutherford, N.J.; Charles A. Hill, Jr., X, Lake Seymour Club, West Charleston, Vt.; Herbert Kaplan, IV, 4141 North Henderson Road, Arlington, Va.; Sherman E. Nichols, XV, 139 Clifton Street, Malden, Mass.; A. Warren Norton, XV, O'Mara and Ormsbee, Inc., 270 Madison Avenue, New York, N.Y.; Donald S. Piston, VIII, 2823 Harrison Avenue, Fresno, Calif.; Professor Ralph L. Rutherford, XII, 11004 Eighty-fifth Avenue, Edmonton, Alberta, Canada; Herman LeM. Schmidt, XV, R.F.D. 35, Washington, Conn.; Philip A. Willis, IV, 51 Edgewood Street, Pottstown, Pa.

What with delivering the Northern New Jersey Club into the capable hands of 1924, checking scholarship applicants at the behest of 1910, and moving to a new home, sleuthing for news was practically stopped. Won't some of you write a few lines now and fill our empty files? — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company, Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, 245 Kent Place Boulevard, Summit, N.J.

1922

Detroit crashes through! Ed Ash has questioned some of the gang, with the following interesting results: Samuel

E. Bickle, II, married, three children, lives at 87 West Buena Vista, Detroit, Mich. When not golfing Sam is chief experimental engineer, Norge division, Borg-Warner Corporation. — Harold R. Boyer, XV, married, four children, lives at 17,700 East Jefferson Avenue, Grosse Pointe, Mich. Bill spends his spare time at the following clubs: Grosse Pointe, Detroit, The Country Club (Detroit), Detroit Racquet, Yondotega, and Grosse Pointe Hunt. Otherwise he labors at being president of the Allen Corporation and director of the Allen Corporation, Industrial Bank, Gear Grinding Machine Company, and Madaras Rotor Power Corporation. For exercise he plays polo! — Charles S. Coney, II, is married, no children. He is a partner in the firm of Brown-Darnell Company of Michigan, with offices in the Dime Savings Bank Building, Detroit. — Ray C. Ellis, II, married, three children, resides at 226 Forest Drive, Kokomo, Ind., where he is manager of the General Motors Corporation plant making auto radios.

D. D. Stowe, II, held out for a long time. He married in 1935 and has no children. Don runs Stowe Motor Sales in Upper Sandusky, Ohio. He takes pains to prove that Sandusky can be reached easily by train or motor and that he would like to see any of the boys.

Charles W. Taylor, II, married, no children, lives at 484 West Goldengate, Detroit. Charlie is supervisor of the group insurance division of Metropolitan Life Insurance Company in Detroit. — Edward A. Ash, XV, himself, reports married, no children, one dog, and can be reached at 6535 Third Avenue, Detroit. He represents the National Chemical and Manufacturing Company of Chicago, Watson-Standard Company of Pittsburgh, and the Operadio Company of St. Charles, Ill. He is president of Ash Products Corporation, and of Rapidex Corporation, and director of Motion Picture Engineering Company, and Pilgrim Investors, Inc., both of Detroit. His clubs are Birmingham Golf, Intercollegiate Alumni, and Detroit Yacht. — Others of the Detroit gang who wish to be recorded in this Hall of Fame, please send your credentials to Assistant Secretary Ash. Do readers of the class notes enjoy gossip like the above?

Sorry, but '21 beat us out in attendance at the annual banquet of the M.I.T. Club of Northern New Jersey (Score 11 to 10). Representing '22: Larry Barstow, Larry Coddington, Tommy Gill, Bill Grady, Milt Manshel, Gus Munning, Jim Nesmith, 2d, Larry Trowbridge, Ev Vilett, and yours truly. — With sadness we report the death on March 12 of Amos H. Stevens, VII (M.D. from Harvard in 1926), at Fairmont, W. Va. Dr. Stevens was a widely known consulting and practicing physician. We express the condolence of the Class to his widow and three sons. — CLAYTON D. GROVER, *Secretary*, Whitehead Metal Products Company, Inc., 303 West Tenth Street, New York, N.Y.C. YARDLEY CHITTICK, *Assistant Secretary*, 77 Franklin Street, Boston, Mass.

1923

There will be an informal get-together of '23 men at the noonday luncheon on Alumni Day in the Great Court and a table or two for '23 men at the Alumni Dinner. Make your plans to be there. — Kent T. Healy is assistant professor of transportation at Yale University and secretary of the committee on transportation of the Yale University Bureau for Street Traffic Research. Healy is one of an impressive staff of experts, headed by Miller McClintock, who are devoting their talents to the street traffic problem. The bureau has developed a new specialized branch of engineering in its traffic study and control techniques.

Max Maltzman writes that after leaving the Institute, he worked in several offices and obtained his license to practice architecture. He specialized in the design of residence income property until the earthquake of March, 1933. He then reports that he decided to try the construction end of the business and is now associated with the Halper Construction Corporation, general contractors, 6150 Wilshire Boulevard, Los Angeles, Calif. — HORATIO L. BOND, *Secretary*, 457 Washington Street, Braintree, Mass. JAMES A. PENNYPACKER, *Assistant Secretary*, 96 Monroe Road, Quincy, Mass.

1926

Our monthly finger exercise continues, with metaphorical complexity, to be a thing of shreds and patches, with the shreds this month coming from the address changes distributed by the Alumni Association and the patches from the replies which Eben Haskell has been getting to the recent appeal for contributions to the class endowment fund.

Shreds. Almost since he left the Institute, William Wraith, Jr., has dwelt in the copper hills of Anaconda, but now he has joined the foreign legion. His address is the Cananea Construction Copper Company in Cananea, Sonora, Mexico. — Edmund G. Bromilow for many years has been with the International General Electric Company, Inc., at the company's Manila branch. From time to time we have had the pleasure of hearing from him about his career there. Now apparently he has resigned from the foreign legion and is stationed in New York with the same company. — We have somehow come to think of Attleboro, Mass., and Robert M. Glidden as all compact, and now we shall have to go through a painful change because Bob has left Attleboro, Mass., for Haddonfield, N.J. It will be a long time before Haddonfield has taken on the Glidden glister, and even then all that glisters is not gold. — Perhaps the most important address change of the month was that of R. Gordon Spear, which the Alumni Association reports in all its majestic and detailed efficiency. Gordon has changed the number of his apartment. — This same system has yielded the charming information that Albert L. Entwistle now lives at 7 Jenny Lind Street, New Bedford, Mass., and that William A. MacQuarrie, Jr., after a

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period of prayers and fasting has admitted the error of his ways and resigned from the Class of 1928 to affiliate with the more select and august company of fireballs and deadheads that compose this Class. We welcome him, and I hope he will be present at the next reunion where we may with appropriate ceremony confirm him as a probationary member of the lodge.

And now the *patches*. Red Libbey, in sending in his check, cautioned Eben apparently not to permit greedy secretariat eyes to see his letter. Eben, however, has reported that worthy of publication is the information that Red is still with the paper company which has been the subject of his ministrations for several years and that his address is International Falls, Minn. Perhaps next time Red will write a letter to the Secretary with instructions that it *must* be published. — Herbert Kaufmann continues in the pleasantly harmonious atmosphere of the Mutual Chemical Company of America at their Jersey City plant. Herb reports that he hopes to get to Cambridge for Alumni Day.

And on that hope, which flutters in the breast of many other members of the Class, we would confect a little homily. In 1936 our Class had the largest reunion that had been held by any Technology Class until that date, but last year our record was busted into smithereens by a group of graybeards in the Class of 1913. We therefore must regain our lead position, and one of the best ways is to train properly for the next reunion by attending as many Alumni Days as possible. Our attendance last June was frightfully meager, and we became the butt of ridicule from some of our neighborly Classes who, not being able to lick us in the Alumni Fund and other such matters, dwelt extensively upon small potatoes. We need to extend our participation in Alumni Day not necessarily for the reason suggested above but because Alumni Day is an opportunity to have a whacking good time and, of equal importance, an opportunity to see other members of the Class. The Secretary hopes to see many of you on June 5. — J. RHYNE KILLIAN, JR., *General Secretary*, Room 3-208, M.I.T., Cambridge, Mass.

1927

On March 23, under the sponsorship of Lew Baker (who now lives at the Tech Club), 19 of the men who are living around New York got together at the Club, which is located at the corner of 39th Street and Madison Avenue. The evening started with the inevitable cocktails, followed by a very good dinner. No speeches were made, but there was plenty of table gossip to keep all fully occupied and entertained. Report on those present: L. B. Woolfenden is a field engineer with the General Aniline Works. — Chippy Chase is studying law and in addition has a business address at 10 East 40th Street. Chippy is married and has two boys — one ten and one seven. — Ed True, whom your Secretary has not seen since graduation, reports

himself as office boy for the Hobart Manufacturing Company, located at 71 Madison Avenue. Your Secretary, from other sources, gathered the information that Ed is office manager for the various Hobart offices in this area. — Maurice Davier has previously been reported to you as manager of the scheduling and forecasting department of Johns-Manville and is located at 22 East 40th Street. — J. L. O'Dowd is a cost analyst for New York and Queens Electric Light and Power Company. — Bob Bonnar is director of research for General Dyestuff Corporation. — Joe Melhado is an associate editorial writer for Standard Statistics Company, Inc. — Bill Kaplan is a design engineer for Power Patents Company and reports a family of two girls, aged 7 and 11. — Lyndall R. Perry is a chemical engineer with the Barrett Company.

George Saliba is chief engineer for the Presto Recording Corporation. George is married and has one boy. — J. Elwood Tweeddale is a consulting engineer with Electrical Research Products, Inc., and is married. — Alan Beattie, who has also been reported recently in these columns, is a printing engineer with the Great Atlantic and Pacific Tea Company, with headquarters in the Graybar Building. — Don Spitzli is in the research department of Congoleum-Nairn, Inc., of Kearny, N.J. — Ernie Dodge is with the radio network department of the American Telephone and Telegraph Company. — Frank Staples is with the American Molasses Company and is married. — Charles Davin is with Brooklyn Union Gas Company as an industrial engineer in sales development. — Rosie Rosenthal arrived late, having been involved in some big deal having to do with photomurals. Rosie is in charge of this work for Apex Studios and was crying dry tears because they have had so much work to do over at the World's Fair.

In addition to the above notes which your correspondent attempted to decipher from the sheet passed around to the men at the dinner, the following was obtained as bits of gossip concerning other graduates not able to be present: Red Earl is living in Jamestown, N.Y., and his young son, Jimmy, is reported to be his pride and joy. Red is with the Jamestown Mutual Insurance Company in an executive capacity. — Bill Felch is reported to have a country estate somewhere near Nyack, N.Y., and is connected with the transoceanic service of the American Telephone and Telegraph Company. He has been married two years. — Dan Sullivan is with the Westinghouse Electric and Manufacturing Company in and around New York. — Howard Chinn is the engineer in charge for the Columbia Broadcasting System. — Don Kennedy is married and is with the Westchester Lighting Company at Chappaqua, N.Y. — Your correspondent, who has adequately reported his activities in these columns previously, was also present at the dinner and reports a very enjoyable evening. In fact the evening was felt to be such a success that there was a spon-

taneous move to have another get-together. The chairmanship for this was accepted by Bob Bonnar.

From other sources we learn that William K. Cave is the engineer in charge of power supply of the Fort Peck Dam development. — Edmund G. Bromilow has been stationed in the Philippine Islands as an application engineer for the International General Electric Company, but his secretary writes that he will receive mail through 570 Lexington Avenue, New York City.

On April 4 Harold Edgerton gave an illustrated talk before the 1920 Class Association of Harvard University in Boston. His very interesting exhibition of slides and high-speed pictures, showing in slow motion what happens to the golf ball when hit, and so on, was much enjoyed. — RAYMOND F. HIBBERT, *General Secretary*, Care of Johns-Manville Corporation, 22 East 40th Street, New York, N.Y. DWIGHT C. ARNOLD, *Assistant Secretary*, Arnold-Copeland Company, Inc., 222 Summer Street, Boston, Mass.

1929

Just about the time you receive this copy and read these notes many of the gang will be headed toward Ye Castle Inn, Saybrook, Conn., where your committee has arranged all the details for a grand 10-year reunion. The men who make the trip will find their journey worth while, we hope, in the renewal of friendships long neglected. We owe much to our committee who gave their time to the planning of an interesting week-end for the rest of us who were too far away to be of much assistance. The support of the whole Class is with the committee, and we will make the toast for all when the occasion presents itself.

Apparently the interest in our reunion extends across the Atlantic, for — as he indicates in the following letter from London, England (March 14) — Arthur Marsh, XV, would be on hand if he could. His letter follows: "With June rapidly approaching, it has been interesting to notice the revival of '29 news in The Review and to observe the wide distribution of localities from which reports come in. Being our tenth reunion year, all of us must have a particularly strong urge to renew the friendships made at Tech from '25 to '29, no less yours truly. However, it appears reasonably certain that I for one will be unable to be present, particularly since I am not anxious to precipitate a second Munich in order to leave London. At present my work is that of a liaison engineer between my firm, Carrier Corporation of Syracuse, N.Y., and our representatives in London, J. Stone and Company, Ltd., in connection with railway car air conditioning.

"After several years of development and production design experience in air conditioning, I finally fell into the type of work that has proved to be the most interesting and valuable of any since I joined Carrier upon graduation in '29. After several years of experience in man-

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ufacturing railway air-conditioning equipment in the States with a few isolated export installations engineered through the home office, we decided to venture in a greater way into the worldwide business. J. Stone and Company, Ltd., through their many branches scattered from here eastward to Australia have made this venture possible. They manufacture car heating, lighting, and generating equipment for railway cars, while Carrier supplies the necessary air-conditioning apparatus for the cars.

"Briefly, my work has been to coordinate the work of our home office in developing suitable equipment for the diversified applications existing throughout the many countries with which we work and to organize the estimating, engineering, and installation departments of the British firm in accordance with our accepted standards. With almost complete absence of standardization in car design in countries ranging from Rumania, Egypt, Iraq, India, Malay to New Zealand, it has forced us to entirely different conceptions of design from those in the States. This has naturally necessitated a start from scratch, but the work is intensely interesting, and I am particularly fortunate in being associated with a British firm of high standing, possessing a splendid personnel.

"All this has resulted in a frequent change of residence as in September, 1937, Carrier moved its scattered manufacturing facilities into the old Franklin Automobile plant in Syracuse, renovated to make possible efficient manufacture of air-conditioning equipment. We lived in Syracuse only six months when we moved to London in May of 1938. For a while last September it appeared I might have an opportunity to witness a few application problems such as we took so lightly in Coast Artillery camp at Fort Preble. London, from September 23 to 28, was far from a comfortable place to be. More than likely, however, I would have seen a few anti-aircraft problems worked out to completion in one way or another rather than the coast defense problems. We all were issued our gas masks, and our apartment building was equipped with many air-raid shelters in basements and subbasements, so while we are in a particularly vulnerable area midway between Parliament, Victoria Station, and the huge Battersea Power Station, the nine floors of reinforced concrete and steel building would probably provide maximum protection from high-explosive bombs. The end was as dramatic as it was sudden, and we were immensely relieved when it was over. Only history will tell whether the outcome was right. Naturally it appears to be far from satisfactory at the moment and may grow worse, but I think it is too soon to base any long-range conclusions. Rearmament in this country is producing a measurable degree of increasing confidence, and optimism for the future seems to be slowly returning.

"I had occasion to visit Nuremberg a few weeks after the crisis and was in the M.A.N. works there for about ten days.

They are one of the foremost Diesel-engine manufacturers, in addition to many other diversified lines of equipment manufacture such as railway car building. They were at the time building Diesel-motored truck chassis for the Air Force, and judging from my observation at one plant over a somewhat longer period of time than most foreign observers are permitted to stay in one place, that output — while large at certain times — was irregular in nature, no production coming off the line for several days at a time. It would be ridiculous to generalize on the basis of our short visit, but it occurred to me that most foreign observers in Germany may have been conducted on carefully planned tours of inspection only to those plants that showed maximum output of the finished article at that particular time. Be that as it may, the people were extremely hospitable, going out of their way to make my stay enjoyable, and with a very fortunate spell of fine fall weather I found Nuremberg a really beautiful town, a combination of medieval and modern aspects.

"Our daughter, Joan, born on Lincoln's birthday in 1937, is picking up her words with an English inflection and will have to learn Yankee all over again when we return, probably in the fall of this year. We have enjoyed England to the utmost and having brought our car over with us we are able to search out places of interest at leisure. Based upon this winter the myth of the London fog seems to be still a myth. There have been many fogs along the Charles River Basin several times more dense than any encountered here to date, and aside from a preponderance of dull weather, the climate has been very desirable, and for once in my life I have seen a winter with only a couple days of snow, although I thought I should have to go to Florida to do so.

"I must cease rambling, but send along best wishes to you and family and wish that it would be possible to see you in Cambridge in June. I hope the 10th reunion will be all it should be and trust a large proportion of the Class will return." — Thank you very much, Arthur, we certainly could stand many more fine, newsy letters just like that. Let us hope that the few we have had these last few months are not all we may expect for too long to come. Again, all, we will see you at the reunion if you can make it. — EARL W. GLEN, *General Secretary*, Box 178, Fairlawn, Ohio.

1931

The VI-A News for March contained the following information about George Bevan and Howie Richardson: "A letter recently came to VI-A headquarters from George T. Bevan, '31, Boston Elevated option. He states that he has been in Denver for about two years working for the Denver and Rio Grande Western Railroad. His work has to do with the testing of locomotive side rods and axles by the magnaflux method of inspection for cracks and flaws. He says he was working in Chicago with the

Chicago Surface Lines just before taking his present job, and so used the Boston Elevated experience gained in VI-A to some advantage. Turning to the more personal side of his life, he informs us that he has been married about two years to a Pittsburgh girl, and passed out the cigars last Thanksgiving when a son arrived. Howie Richardson, '31, is often seen these days strolling around the corridors at the Institute. He is employed with the Hygrade Lamp Company in Salem, and is taking time off for some advanced study in Engineering and Laboratory Statistics."

The Chase National Bank of the city of New York has issued a brochure by its Vice-President, Joseph E. Pogue, entitled "Economics of the Petroleum Industry." Credit for assistance in preparation is given to Norman D. FitzGerald of our Class and Basil B. Zavoico '24 among other members of the staff of the department of petroleum economics of the Chase National Bank.

Frederic W. Nordsiek has resigned as executive secretary of the New York Diabetes Association, a position he has held on a part-time basis since April, 1938, when he became associate in the department of nutrition of the American Institute of Baking, New York City. Mr. Nordsiek has been granted a patent, by the United States Patent Office, for an improved acidophilus preparation. The patent is assigned to the company by whom Mr. Nordsiek was employed when he developed the product some years ago.

Through the courtesy of Walter G. Whitman '17 we have the following notice of appointment from Syracuse University: "Dr. Charles D. Luke who joined the faculty of the College of Applied Science, Syracuse University, in September, 1937, has been appointed acting head of the department of chemical engineering, succeeding the late Dr. Lloyd Logan ['24] who passed away last December. Dr. Luke is the son of Dr. and Mrs. Edward Luke of Coin, Iowa, where he was born on October 4, 1907, and where he received his secondary education. In 1929 he was graduated from the State University of Iowa and afterward matriculated at the M.I.T., where he was awarded the degrees of master of science and doctor of science in chemical engineering. While a student at the Institute he served as an assistant in the research laboratory of applied chemistry, and in the summer of 1931 assisted Dr. W. K. Lewis ['05] in the petroleum summer school. Additional time was spent by Dr. Luke in consulting work with the M. W. Kellogg Company, Merrimac Chemical Company, Standard Oil Company of New Jersey, and the E. I. du Pont de Nemours and Company. This work involved the design of distillation and absorption equipment and research on catalytic processes. Dr. Luke was coauthor with Dr. Lewis on a thesis entitled, "Vapor-Liquid Equilibria in Complex Hydrocarbon Mixtures at High Pressures." He also was coauthor with Dr. Lewis on publications appearing in

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Industrial and Engineering Chemistry, and *Transactions* of the American Society of Mechanical Engineers.

"After leaving the Institute, Dr. Luke served in the process engineering department of the Standard Oil Company of Louisiana in Baton Rouge, La., where his time was spent in plant test work, laboratory research, and economic surveys of new processes. Later he was on the staff of Luis de Florez ['11], consulting engineer of New York City. During this period he was engaged in plant test work, design and operation of cracking units, refinery surveys, cost analyses, and consultation with refineries on cracking research and development. Considerable time was also spent in pioneer research in refineries and in the laboratory on the chemistry of cracking, in connection with legal matters with which the firm was concerned. At the College of Applied Science, Syracuse University, Dr. Luke was associated with the late Lloyd Logan, Gerard Edell, and A. Raymond Moses in the administration of the division of chemical engineering. Luke is an active member of the American Institute of Chemical Engineers and of the American Chemical Society. He is also a member of Alpha Chi Sigma, professional chemistry fraternity; Phi Lambda Upsilon, honorary chemistry fraternity; Tau Beta Pi, honorary engineering fraternity; and Sigma Xi, honorary scientific fraternity.

"Music is listed among the various hobbies of Dr. Luke. While in the Middle West he played the cornet in several professional organizations and American Legion bands. . . . He has sung or played with various amateur organizations in Boston, Baton Rouge, and New York City. Since coming to Syracuse, he has been a member of the Syracuse University Chorus, under the direction of Howard Lyman. Dr. Luke is unmarried and resides at 613 University Avenue, Syracuse, N.Y." — BENJAMIN W. STEVERMAN, *General Secretary*, 11 Glenland Road, Chestnut Hill, Mass.

1933

The volume of news is rather small again this month. However, we do have some announcements from the society columns. The wedding of George V. Sweetnam to Miss Olive M. Keene took place on March 18 in Revere, Mass. The Sweetnams plan to live in Revere. We also have a notice of the engagement of Donald A. MacCornack to Miss Eleanor Mathesius. MacCornack is now practicing architecture in Cleveland. Fred Murphy's engagement to Miss Anne Doyle has just been announced; they are to be married in the fall.

A note from the VI-A *News* of March reads as follows: "All VI-A men, both alumni and undergrad, who are interested in manufacturing, ought to read an article in the February number of *Electrical Engineering* by T. C. Johnson, '33, of the General Electric Company."

No doubt, many of you fellows plan to come to the World's Fair, here in New York, this summer. From all indications

we are going to have quite a Fair and also plenty of out-of-town visitors. If you plan to come and we in New York can do anything to help you, either before you get here or when you arrive, we will be glad to have you get in touch with us. Perhaps we can locate some reasonable accommodations for you during your stay. My telephone number is Dickens 2-4900, and my address is below. — GEORGE HENNING, JR., *General Secretary*, Belmont Smelting and Refining Works, Inc., 330 Belmont Avenue, Brooklyn, N.Y. ROBERT M. KIMBALL, *Assistant Secretary*, Room 3-102, M.I.T., Cambridge, Mass.

1934

A letter from Jim Sweeney does an excellent job of summing up the news from New York. We can't improve upon it, so we will quote it verbatim: "The spirit is willing but the flesh is weak" is a swell alibi, but a much too handy one. Very dutifully, it has been my intention for seeming ages to drop you a line, but to no avail. Finally, circumstances force me to; so here goes. The 'circumstances' were in the form of a dinner held recently at the new quarters of the Technology Club of New York at which the dubious honor of reporting to *The Review* the events of the evening was bestowed upon me. At the dinner, which took place on March 22, was born the '34 \pm Club,' the brain child of the combined enthusiasm of Jim Eder, Sam Joroff, and Dean Dadakis. It seems that the trio had struck upon the idea of a get-together dinner as a means of launching their idea to get the '34 crowd together and make '34 as famous hereabouts as it is in the annals of the Institute. It proved to be a colossal (apologies to Sam Goldwyn) success. About 30 fellows, well over half the number of '34 men residing in or near New York, attended and amid great enthusiasm decided to make such get-togethers regular monthly affairs.

The boys were welcomed to the new quarters by Alfred T. Glassett '20, President of the Club, and were made acquainted with the splendid facilities offered by the Club. Jim Eder proved to be a second Dale Carnegie as toastmaster at the dinner which, incidentally, was an outstanding example of the Club's famous cuisine. Since Jim's return from the Canal Zone, he has spent most of his time doing research for American Radiator. Recently he and a fellow worker purchased the equipment of the laboratory where they were working and have started out in business for themselves under the firm name of Walker and Eder. They are doing general industrial research work, specializing in heat controls. Jim is all for the idea of having one's own business.

"And speaking of business, here's something that will interest all the \$\$\$ minded. Eric Isbister developed the brilliant idea of doing a little economic research among those present. The result was a poll of our monthly salaries, revealing some rather startling statistics. Of the 30 or so present, the monthly wages were: lowest, \$120; highest, \$333; aver-

age (arithmetic), \$196.70. The most common salary, despite the average, seemed to be \$200. Incidentally, the average figure is already out of date, as I received a substantial increase myself this week. We would be interested in learning how our classmates in other parts of the world are making out. All in all, everyone seemed a bit surprised at the results.

"Credit for having come the farthest to attend went to Adrian Ross, who is now a Connecticut Yankee from Stamford. Ad is now busy informing the world of the merits of Electrolux vacuum cleaners. After graduation he went with the Brooklyn Navy Yard, but after finding difficulty distinguishing between the official 26-days-a-year vacation period and the remainder of the year, he left to take his present position. To the uninformed Walter Winchells, Ad deserted the ranks of the benedicts several years ago and is now a proud papa. Ed Taylor, another VI-A, also joined the staff at the Brooklyn Navy Yard. Ed is working in the material lab there, as are also Larry Stein and Johnny Hord.

"Most of our other members are either in private industry or still boning away. Joe Seligman has turned into a budding barrister, having been graduated from law school last June. Joe also saw service at the Harvard Business School for a spell. Baskin, X-A, is another who is legally minded and is at present attending law school. He has been in patent work since leaving the Institute and is so engrossed in the work he even tried to sell the rest of us the idea of going into the field. Walter Wise, Jr., is another bitten by the bug for more learning. Pete is looking toward the day when he can put C.P.A. after his name. For the past four years he has been undergoing transformation into an accountant at Colgate's Jersey City office in the daytime and at school in the evenings. Don Lister forsook his intentions of becoming a patent lawyer and has joined the money-changers at one of the local banks. George Bull and George Priggen are both plugging for Pegasus, Socony-Vacuum's famed flying red horse. Bull is with the paint division, earning (according to George) about twice what he is paid, while Priggen is peddling lubricants, getting paid (according to George) about twice what he earns. Priggen's display of his burlesquing ability made us wonder if he didn't miss his calling. Paging the Old Howard.

"Bob Franklin (formerly Max Levy), after spending a couple of years in a family enterprise, joined up with the Carrier Engineering Corporation, export division, and is now trying to sell air conditioning to the Hottentots. Sam Joroff, XVII, is with his father's firm and since graduation has spent time on the various rungs on the way up the ladder. At present he is a sort of combined foreman-superintendent. Andy Andresen, another XVII man, is with the Turner Construction Company at the New York World's Fair. Andy spent a couple of years around Boston and then decided to try his luck in the big city and is making out fine. Recently he married a lass from

1934 Continued

Boston and has settled down on Long Island. Charlie Glueck has an interesting job doing some hiring for Electric Bond and Share and gave the gang several interesting high lights on this all important business of being personnel man. Johnny Westfall, of boathouse fame, after spending a couple of years building ships up in Maine, is now with M. W. Kellogg in Jersey City. Charlie Lucke, Johnny's sidekick, gave his usual addition of color to the festivities, leading some nostalgic choral singing. Charlie is now with the Wilson Mechanical Instrument Company and is another of the growing group of proud fathers.

"Ben Fisher, XIII-C, related his various experiences with the Grace Line. He is now in the industrial department, working on various engineering problems. Previous to this he served as a third engineer on the S.S. *Santa Elena*. Ben is an enthusiastic yachtsman and at present is having built a boat of his own design for which he is already making some claims. Ed Sviki, another representative of XIII-C, has been with Moore and MacCormack who operate the 'Good Neighbor' fleet to South America and the Scantic lines to northern Europe. Ed has worked himself up through the various departments of the company and now seems to be their head man on statistics. Tjark Reiss, IV-A, is now associated with his father after spending some time abroad. During his travels abroad he met several Tech men, including a former classmate, Frank Brazel. Charlie Rynd is selling time on the major networks for N.B.C., hobnobbing with the Rudy Vallee sponsors and all the other 'big timers.' Freddie Vaughan is now in the lithograph business. Bob Ghelardi, father of two daughters, seems to be prospering better than any of us, at the Raritan Copper Works. Johnny Finneran is with National Dairy Products Corporation. Duane Davis is with Musicraft Records. John Dunning is another who has forsaken engineering for business and has joined the bankers (Corn Exchange Bank Trust). Charlie Finnigan is a radio engineer with the R.C.A. license lab. Ivar Malmstrom has remained by the fireside and is associated with his father.

"It seems that everyone present had at least one item of news about some other classmate, but my memory and secretarial ability are equally poor. However, I have a few other items — mostly about XIII coursemates. A couple of months ago on a business trip to Washington I dropped in on Charlie Wright. Charlie left the Fore River yard of Bethlehem Shipbuilding Company last September and joined the Navy Department in Washington as an associate naval architect. Bill Woodman has been with Gibbs and Cox for several years on merchant-ship design. Tom Donlan is still on outside work down at Fore River, where he is working on the navy airplane carrier, U.S.S. *Wasp*. Ed Fleming and Donald MacNaught, both of the drafting room at Fore River, have been giving a course on structural design to members of the drafting department. Ed Strohmeier, assistant to the Vice-

President, was recently transferred from Fore River to New York. Stan Bebler, famed for his eructative powers, also of Fore River, is the proud daddy of twins — a girl and a boy. Doug MacMillan, who has been with the Federal Shipbuilding Company since 1934, presented a paper at the last meeting of the Society of Naval Architects and Marine Engineers.

"At the meetings of the society I met a few others of our former classmates. Johnny Newell, after spending a spell at Fore River and another at Bethlehem's West Coast yards, is up at Bath, Maine, with the Bath Iron Works. Al Gray, who left our Class and returned to finish in '36, is also at Bath after spending a couple of years at Sun Ship at Chester, Pa. Both Johnny and Al have been giving courses at Bath's evening schools. I saw Tom Burton some time ago but have lost track of him lately. Last I saw of him he was at the New York office of Ingersoll-Rand. I also bump into Bill Main occasionally. Bill was formerly with Erie Railroad, but is now with the New York Central.

"Getting back to the aforesaid '34 ± Club: While it is intended primarily for members of our Class, all are invited to join our functions, and we would appreciate it if you would ask the Secretaries of the Classes of '33 and '35 to announce in their columns that members of their Classes are particularly welcome. Hence the reason for the 'plus or minus' appellation. Information concerning the meetings can be obtained by contacting Jim Eder, 29 Washington Square West, New York City (telephone: GRamercy 7-2743)." — Thanks, Jim, for all the news. That's the kind of letter that brings cheer to your poor struggling Secretary. Why don't some more of you fellows get fits of conscience and write some long lusty letters likewise?

Edward B. Locke, who is now with the Youngstown Sheet and Tube Company at Youngstown, Ohio, reports that he is happy on the job. He started in at Youngstown a few months ago as an apprentice observer in the blooming mill. That job offered special opportunity to pick up useful information, in that the observer has to follow each heat of steel all the way through the mill and give special attention to each heat which is a different problem in itself. About the first of March there was a vacancy in the open-hearth department, and he was promoted to be an observer in that division. Incidentally, he says, there is a lot to learn which is not found in books. On the first night that he worked a shift on his own he was a busy man, as one time during the evening three separate furnaces were all being tapped and poured at the same time, so that, as he said, he had to jump around like a rabbit to get all the necessary information for records. Steel mills are on a three-shift basis, from 8:00 A.M. to 4:00 P.M., 4:00 P.M. to midnight, and midnight to 8:00 A.M., and men are rotated every week or two from one shift to another.

Another letter of considerable interest was received from Bill Ball, who is in charge of the Ethyl Gasoline Corpora-

tion's motor clinic now at Wilkes-Barre, Pa. He writes: "Since writing to you last, we completed some very successful stays in Altoona, Oil City, Pa., Scranton, and we are at present operating in Wilkes-Barre. The latter two cities are in the heart of the anthracite country. Down there they are seeking a two-million-dollar appropriation from the government for research on new methods of using anthracite coal. Possibly Charlie Locke '96 should know about it in order to get M.I.T. in on the program if possible. From Wilkes-Barre we are going to Binghamton, N.Y., Elmira, Syracuse, Rochester, Buffalo, Jamestown, Utica, and so. If there are any M.I.T. clubs in those areas, we extend a blanket invitation to them to spend an evening at the Ethyl motor clinic.

"I haven't run into many of the boys, because the alumni directory (printed in '35) is so out of date that many have moved away from addresses shown therein. In Philadelphia two weeks ago, I called up Ed and Ruth Bromley but found that they were away on a cruise. No M.I.T. club was listed in the phone book for Philadelphia, so was unable to contact any of the other boys there. When we get to Rochester next fall, I'll have to get Phil Kron by the neck and make him write you a letter. In Pittsburgh, last spring, I met Butch Patch, and he and I and Stan Johnson went through the Homestead works of the Carnegie-Illinois Steel Company. It was very interesting to see the smelting and rolling operations. One advantage of traveling about the country is the fact that we do get into these various industrial centers. At Oil City we visited the Pennsylvania oil fields and found that recent rises in the price of crude were making the area very much more prosperous and happy than it had been in some time. At Altoona, the Pennsylvania Railroad car shops were testing the new locomotive for use at the World's Fair. The tests were being made on a dynamometer, and it's some sight to see a big locomotive going 80 or 90 miles an hour standing still on the rollers. In Scranton, the Hudson Coal Company took us through their mines to give us a picture of the problems faced by the anthracite producers. They are doing a grand job despite the rather hectic conditions in the industry.

"At the present time, we have a clinic operating in Providence and one at New Rochelle, N.Y.; so if you are able to drop in for an evening, I know you would enjoy it. In the clinics we are using chassis dynamometers to show the oil and automotive industries the advantages of better fuel and proper motor tune up for better fuel, in an automobile operating at wide-open throttle standing still. There are 11 clinics operating in the large cities.

"The New York City M.I.T. Club has moved to new quarters. I received an invitation from Dean Dadakis to a dinner there but was unable to attend. M.I.T. men in New York for the Fair should certainly plan to see the new Club. It is at 24 East 39th Street, in the heart of New York."

Plan to attend Alumni Day, June 5

Herb Andrews, our Course X Secretary, writes: "Not much this month except of myself. I was married on January 26 to Miss Blondie H. Johnston of Westfield, N.J., in the Presbyterian church there. Miss Johnston was graduated from Mount Holyoke in '34. We took a honeymoon trip to the West Indies on the S.S. *Manhattan*. On the boat, for the first time since graduation, we met Marvin Silberman and his wife. They distinguished themselves at the ship's masquerade ball, winning first prize as Mr. and Mrs. Taxpayer, dressed in torn sheets and a hungry look. I am now living in an apartment at 1001 East Front Street, Plainfield, N.J., a new garden apartment development of rather some proportions.

"I have left Mr. DeFlorez' office and am now a development engineer with Colgate-Palmolive-Peet Company in Jersey City, a very fine company. There I found Freeman Hudson working also, in another department. Freeman is Assistant Secretary of the very active M.I.T. Club of Northern New Jersey." — More letters like these and we will really have something.

A few items of social interest are the engagements of Miles VanValzah Hayes to Miss Elizabeth Clement Field, daughter of the late Mr. and Mrs. William Henry Field of Mendon, Vt. Plans for a spring wedding were being made. — On the evening of March 4 Frederic Stephenson Haggerson and Miss Isabel Rogers Whitman became husband and wife. The ceremony took place in the First Unitarian Church of Niagara Falls, N.Y. The reception was held at the Niagara Falls Country Club. Mrs. Haggerson is the daughter of Mrs. Homer Whitman and the late Mr. Whitman of Niagara Falls. — Announcing a new arrival and a future Tech man, we hope, are Mr. and Mrs. Irving Guay of 74 Monument Avenue, Swampscott, Mass. Master Irving Edward Guay, Jr., arrived on the 13th of March and weighed all of six pounds and ten ounces. — JOHN G. CALLAN, JR., *General Secretary*, 184 Ames Street, Sharon, Mass. ROBERT C. BECKER, *Assistant Secretary*, 169-49 24th Avenue, Flushing, Long Island, N.Y.

1935

Guess I'd better start this column with a bow and an apology in the direction of Walt Stockmayer. Seems Stocky went off the deep end some time ago, and I omitted to mention the fact in this column, although it did appear in the class survey. Details: The lucky girl was Sylvia Kleist Bergen of Quincy, Mass.; the engagement was announced last June; and they walked the middle aisle on August 12. — Some time ago we announced the engagement of Ken Finlayson. Seems they really meant it, for on March 5 Miss Lucy MacBride became Mrs. Finlayson. Dave Hollidge is also listed among the winners. He and Miss Elizabeth Smith of Milton are engaged. Dave was with the Class of '33 for two years and then in our Class for two years.

Miscellaneous items picked up from here and there include the fact that C. Darwin Stolzenbach (used to be Charlie to us) now has the mail address of United States House of Representatives, Room 312, House Office Building, Washington, D.C. Last news we had of C. Darwin was that he was "available." What is this Charlie, patronage in our midst? Hal Everett has been shifted back to New York City by the Foxboro Company. Les Lappin is now with the Federal Telegraph Company in Newark, N.J. Congratulations go to Howard Staley who has been promoted to an assistant professor at good old Tech.

It is with great regret that I must pass along the news of the death of Ed Clark. Ed was working for the Anaconda Copper Company at Butte, Mont. He died there on March 30 as the result of a mine accident earlier in the day. Ed was one of the best known and liked members of the class and we will miss him.

Believe it or not, Mal Porter has made another change. Mal holds the class record for changes of address, 14 so far that I know of. He is now located with the Du Pont Company in Wilmington, Del. Credit for this bit of news goes to Charlie Locke, '96, Alumni Secretary. He writes: "It is rather interesting that he had been in correspondence with the company about a job, but nothing seemed to be coming of it, so he started out from Baltimore one morning for the West, to see what he might find in the way of an opening. He had gone only about 30 miles from Baltimore when a car which he was passing crowded him on the narrow, high-crowned road. Porter had to apply the brakes and swerve his car suddenly, with the result that the car turned over. Fortunately he escaped unhurt, and the car was only slightly damaged. He drove it back to Baltimore and there found a letter from the Du Pont Company which led to his present job. The work will be in the explosives division, and it seems likely that during the next two or three years Porter may be on field work, investigating the use of explosives in the various mining fields of the country."

We will close the notes this time with some news sent in by Walt Stockmayer. Stocky finds himself pretty busy with both teaching and a doctor's thesis on his hands. He has hopes of finishing the thesis by the end of the summer. Next year he will remain at the Institute as an instructor in freshman chemistry. Howard Mason, Paul Panagiotakos, Walter Green, Leo Epstein, and Dudley Williams are also working for doctors' degrees at the old stamping grounds. Paul Goldberg just finished his work in inorganic chemistry. Mason, Panagiotakos, and Green are all organic chemists and will be graduating as this issue of *The Review* arrives. Walt mentioned that the versatile Epstein has had a mathematical paper accepted by the *Journal of Mathematics and Physics*. Gerry Golden, in addition to keeping his old job with the Service Caster and Truck Company of

New England, has added a side line of consulting safety engineering. Thanks for the letter, Walt.

Don't forget the class get-together at the University Club at 4:30 P.M. on Alumni Day, June 5. — ROBERT J. GRANBERG, *General Secretary*, Care of Mrs. W. Miller, Prince Bay, Staten Island, N.Y. RICHARD LAWRENCE, *Assistant Secretary*, 111 Waban Hill Road North, Chestnut Hill, Mass.

1936

It is especially hard to start the column this month because I have to announce the death of one of our classmates: Shorty Hubbard was drowned when the canoe in which he and a companion were trying to shoot the rapids capsized in the Genesee River near Buffalo. It was a particular shock to me because I had heard the two who were drowned and two other fellows — among the latter Reid Ewing '35 — planning the proposed adventure. Shortly after noon on Sunday, April 16, Shorty and his companion started down the rapids of the river swollen by the spring thaws. Ewing and his friend were following on foot at the top of the deep gorge through which the river flows, but made no attempt to keep the canoeists in sight. Rounding a turn, they came upon a group of excited people and learned that the canoe had overturned. Hubbard was swept down the river, but his companion managed to reach the opposite bank and was still alive after he was reached with much difficulty. His rescuers had to descend the cliff and ford the stream to reach him. However, he died before he could be given medical attention. I grew to know Shorty quite well since he was transferred to the Linde laboratory here in Buffalo. All his friends deeply regret his death, but I know they will remember him for his pleasing personality, friendly manner, and hearty laugh.

Newspaper clippings this month announce that two more of our Class are engaged: Henry Runkle, XVI, has won the hand of Miss Natalie Dean of Waltham, Mass. Runk's fiancée, an alumna of Bridgewater State Teachers College, is a member of the faculty of Waltham High School. Runk is working in St. Louis for Curtiss-Wright Corporation. — We also have confirmation of the rumors about Dick Hickman, XVII. Dick's wedding to Miss Delia Peet of Knoxville, Tenn., will take place in that city this month. The bride-elect is a graduate of the University of Tennessee. Dick is still working for the Tennessee Valley Authority. — A third clipping reports not an engagement but a new position for Ariel Thomas, I. He is now district sanitary engineer for Highland, Ill. The part of the clipping that gave me a laugh read: "Mr. Thomas is a *graduate* of the University of Illinois, and *took some work* at the Massachusetts Institute of Technology." The italics are mine.

Charlie Holman's girl, Priscilla Denison, visited him in Akron over Easter and came back to Buffalo with some bits

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of news for your Secretary: First, she reports that Wen Fitch, also of Akron, is peeved at me. Apparently these columns announced his engagement after he was living with the girl, and I never did announce his marriage. Well, let it be announced now that he has been married for two years. Mrs. Fitch is the former Gertrude Seagrave. Satisfied now, Wen? Wen is employed by the B. F. Goodrich Company. Incidentally, I can't pass this opportunity to say that the omission he complained of is Wen's own fault; he should have written and told me those things! Second, Herb Borden was married on April 15 to the former Miss Margaret MacCallum. After a wedding trip to Bermuda, Herb settled down to work again with the Standard Oil company at Bayonne, N.J. Walt Squires' address in Baton Rouge is very appropriately 159 Lovers' Lane!

Course VIII. It was good to hear again from our friend Charlie Evans, who furnishes the following news: In a letter dated February 5, Carl White says: "A good many things have happened in the last several months. However, two of them are more important than the rest. Number one was the arrival of a yelling bit of femininity named Patricia Louise, born December 22 at the Worcester Memorial Hospital and still squawking; seven pounds six ounces at birth, now nine pounds eight and three-quarters ounces, and still growing. What an appetite — continuous too! As a proud papa, I consider her a challenger for the title of Miss America in 1958; as an impartial observer, I would call her a well-formed baby and very healthy. The other major contemporary event concerns my efforts to become independent. I have started a business. Name: The Industrial Electronics Company, 170 Summer Street, Boston, Mass. As you may infer from the title, the business is involved with my first love — electronic-control work. We are primarily interested in solving industrial problems by electronic methods. Hope to manufacture and sell certain types of electronic apparatus and instruments for automatic inspection, control, counting, sorting, measurement, and so on. In the meantime, the idea is to serve as consultants on particular problems and to manufacture and sell the items we specify. We have a good many more problems on the books than we can handle, and have done practically nothing in the way of looking for business — and still they come in."

This good news was soon followed by a long letter from Ken Cook, who has recuperated enough to go back to school. That's the best thing we've had to report for a long time. Ken has picked up a lot of information about some of our classmates. He says: "... I am pleased to inform you that I am now back at Tech, and, if things go along well this term, I hope to get my S.B. degree in June. I left the san last May, and after rehabilitating the old physique during the summer months at my sister's in Lynn, Mass., I reentered the Institute last September. At first I felt like a lost soul

around school, since even the former frosh of my junior year had graduated long since. However, as soon as I became acquainted with some of the fellows in Course VIII, I felt a little more natural at being back. I'm sure you'd be interested in learning about some of the fellows whom I've seen during the year — which are not very many. During September I saw Darby Merrill a number of times; and because of my knowledge of how he loves to swap yarns with fellow rovers, I could find him easily on almost any afternoon by stepping over to the Sailing Pavilion. At that time he was completing his requirements for his S.B. degree, which he obtained last February. I was lucky enough to see Wayne Hazen on a number of occasions in 1938. For in June he came East to attend his sister's graduation festivities at Wellesley and to start out with her thereafter on a trip to Europe, through parts of which they bicycled during the summer months. On his return to the United States in October, he visited me at the dorms and, for old times sake, sat in with me at one of Professor Harrison's lectures. Also we watched the field day competitions. As you may know, Wayne has passed all his preliminary examinations for his Ph.D. at the University of California and has only his thesis remaining. A recent letter from him informs me that temporarily he took on a full-time job to supervise and plan the construction of various scientific exhibits at the San Francisco Fair. When this work is over he plans to make concerted efforts to get his thesis under way.

"Carl Jacob is now, as he was last year, an assistant in the Aeronautics Course — though oddly enough, he has this year undertaken to venture into the field of biophysics and is taking courses allied with this field. Ken Arnold has an assistantship in the Math Department, and I see him rather often. He informs me that Milt Dobrin is still in the geophysics division of an oil company in Pittsburgh and is taking night courses at the University of Pittsburgh. I believe that ultimately he hopes to go out in the field for field-work experience. Speil got his doctor's degree in ceramics recently, and since his name no longer appears on the door of his former lab, I assume that he has left to go out into industry, though I cannot say for sure. As for myself with regard to what field I hope to enter, I may say that currently I am thinking of going into geophysics. I am doing my thesis under Dr. Slichter in the Geology Department. Frank Bliss, who was in Course VIII until after our sophomore year, when he transferred to Harvard Dental, was graduated last June *magna cum laude* and was married in August to Miss Edith Kelly, a Simmons graduate."

I think that Ken deserves a medal for digging up all that news. It's more than I've been able to get in all the time since we were graduated. A few days ago, I received a letter from Bill Abbott, which I shall also pass along in part: "Last September I completed the General Electric test course (student engineer training

course) which gives one practical experience with the company's products. I even went so far as to be given an opportunity to run some 5,000-horsepower d-c reversing rolling-mill motors. These were going to the Carnegie-Illinois Steel — not exactly a physicist's job. Now I am in the magnetic section of the General engineering laboratory — permanent magnet design, magnetic measurements, iron detectors, and general development. It is interesting because you come in contact with so many departments in the company — research laboratory, commercial, and engineering departments, and sales offices. We answer inquiries on special equipment not built by the regular manufacturing divisions. We also build special equipment in small quantities — among the items is Arthur C. Hardy's [18] recording spectrophotometer, strain gauges, thickness gauges, integrating exposure meters for blueprinting and lithography, photoengraving, and so on. Engineering, development, manufacturing, but no real research — those are the laboratory's functions. I am living with six other fellows in a house which we maintain, have a colored boy to cook, and so on. — This group principle is the common solution to decent living in this locality."

"I am still in the research lab of the Eastman Kodak Company," says Charlie of himself, "as is Dave MacAdam, who was married during the past year. Dave and his wife are living on Selye Terrace here in Rochester. Dave has been turning out a lot of papers on the theory of color measurement and specification, which have appeared in the *Journal of the Optical Society*." — Thanks to Charlie for a newsy letter. Who will be our contributor next month? — ANTON E. HIRT, *General Secretary*, 491 Ashland Avenue, Buffalo, N.Y. ALLEN W. HORTON, JR., *Assistant Secretary*, Room 3-208, M.I.T., Cambridge, Mass.

1938

Your Class Secretaries are still complaining about the paucity of news which reaches them from the Class as a whole, but they really take heart when someone like Welcome Bender, XVI, crashes through as he has this month. It seems that Bill and a couple of other fellows took a trip to Baltimore recently, collected a lot of news, and visited the hopes of aeronautical science, Jack Wallace, *et al.* The "hopes" are designing just about everything but airplanes — from a service station on wheels (to service the clippers) to a flagpole for a flying field! The following are items contributed by Bill: We shall tell you about him first, although Welcome did not give us the news in this order. He is learning to fly (at government expense) under the new Civil Aeronautics training program, the lessons coming about three times a week at five in the morning. We can't figure out whether Bill actually gets up then or doesn't go to bed until afterward. He and Chauncey Bell, also XVI, are straining to finish their masters' theses on air-line economic problems. Jay AuWerter, the Course XVI Secre-

Plan to attend Alumni Day, June 5

1938 Continued

tary, is also reported to be suffering from thesisitis at this season. Barney Oldfield and Hymen Katz complete the contingent from our Class in Course XVI who have been at Tech this year.

Before going further with Bender's news, it might be well to advise you of a marriage that has come to our attention since the last notes were written. In February, J. Aldridge Johnson, XVI, was married to Miss Mary Nadine Madsen in Coral Gables, Fla. The couple will live way over on the other side of the continent in La Cañada, Calif. — To return to Bender's communication, he tells us further: Malcolm F. McKeag, IX, is giving Grover Whalen a hand with the World's Fair by working in the Museum of Medicine (we're not sure of the title of the building). Be sure to look him up in your tour of the Fair. — Andrew P. Stergion, XVIII, has just returned from an extensive cruise in tropical waters where he has been working for the government oceanographic survey. He tells us he has been measuring all sorts of things about the ocean and will spend most of this summer correlating the data collected. We hardly knew him when he dropped into Boston with a mustache and a Havana accent.

This seems to be the airplane issue! Here are three more fellows connected with their manufacture: Dave Irving, XVI, is in Philadelphia with the Edward G. Budd Manufacturing Company, working, we understand, on the development of stainless-steel construction for aircraft. John Noyes, Jr., II, is with Curtiss-Wright in St. Louis, and Lou Kites, XVI, the former high flyer of the track team, is with Hamilton Standard Propellers. — And while we are on the subject of things aeronautical, it might be worth while to note that Lewis Hull, X, came steaming into Boston lately to search out the "friend" who sent him a good-sized wind tunnel by parcel post!

F. William Brown, VIII, is now working for his master's degree at Cal Tech under Dr. Goetz. He reports, besides some progress in his work on photographic graininess: "Country very interesting; many nice bars and good-looking girls." And with the famous Californian weather, we guess that Bill is enjoying himself. We hear also that C. Barrett Campbell, X, is a research chemist for the Acme White Lead and Color Works in Detroit. — Ira Lohman, VI, was recently transferred by Jackson and Moreland, consulting engineers, to Allentown,

Pa., for an unstated length of time, "probably until fall." — Just as Jack Chapin was thinking about getting around to his oft-postponed thesis, he was offered, and accepted, the assistant directorship of the Buffalo Station of the Chemical Engineering Practice School.

Fred DuBois, XV, on a recent visit to Boston, inspected the new headquarters of the Aeronautical Engineering Society, an elaborate outhouse abandoned by Stone and Webster after the completion of the new Rogers Building. He says that he was touched profoundly — for funds to build a new sailplane! The point of this story is this: By the time these notes are printed, we hope that you, too, will have been touched, by an appeal to get our class fund well on its feet. We mention the fund here to remind you of your opportunity to contribute if a letter to that effect has reached you, or to bring the matter to your attention if a letter has not already done so. A contribution would be an appropriate way to observe your first anniversary of graduation. — DALE F. MORGAN, *General Secretary*, Graduate House, M.I.T., Cambridge, Mass. LLOYD BERGESON, *Assistant Secretary*, 885 Beacon Street, Newton Centre, Mass.

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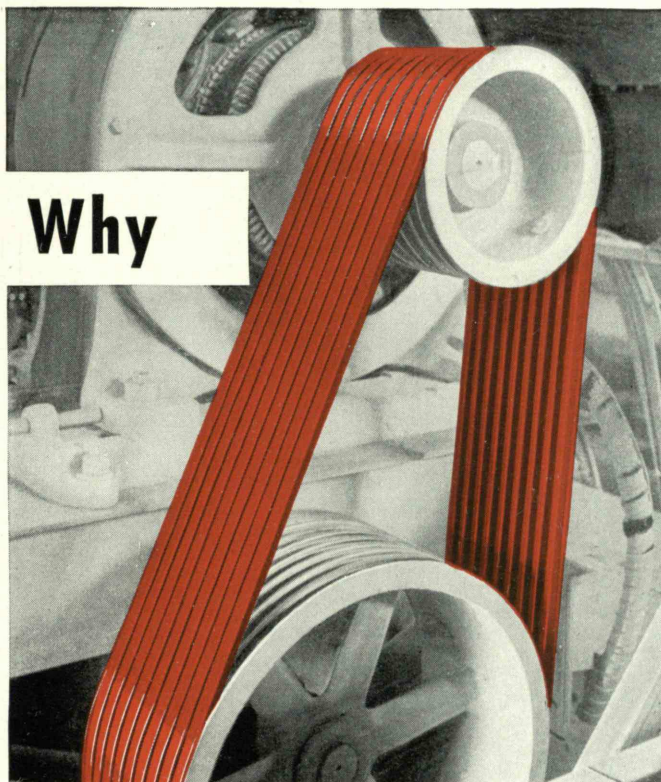
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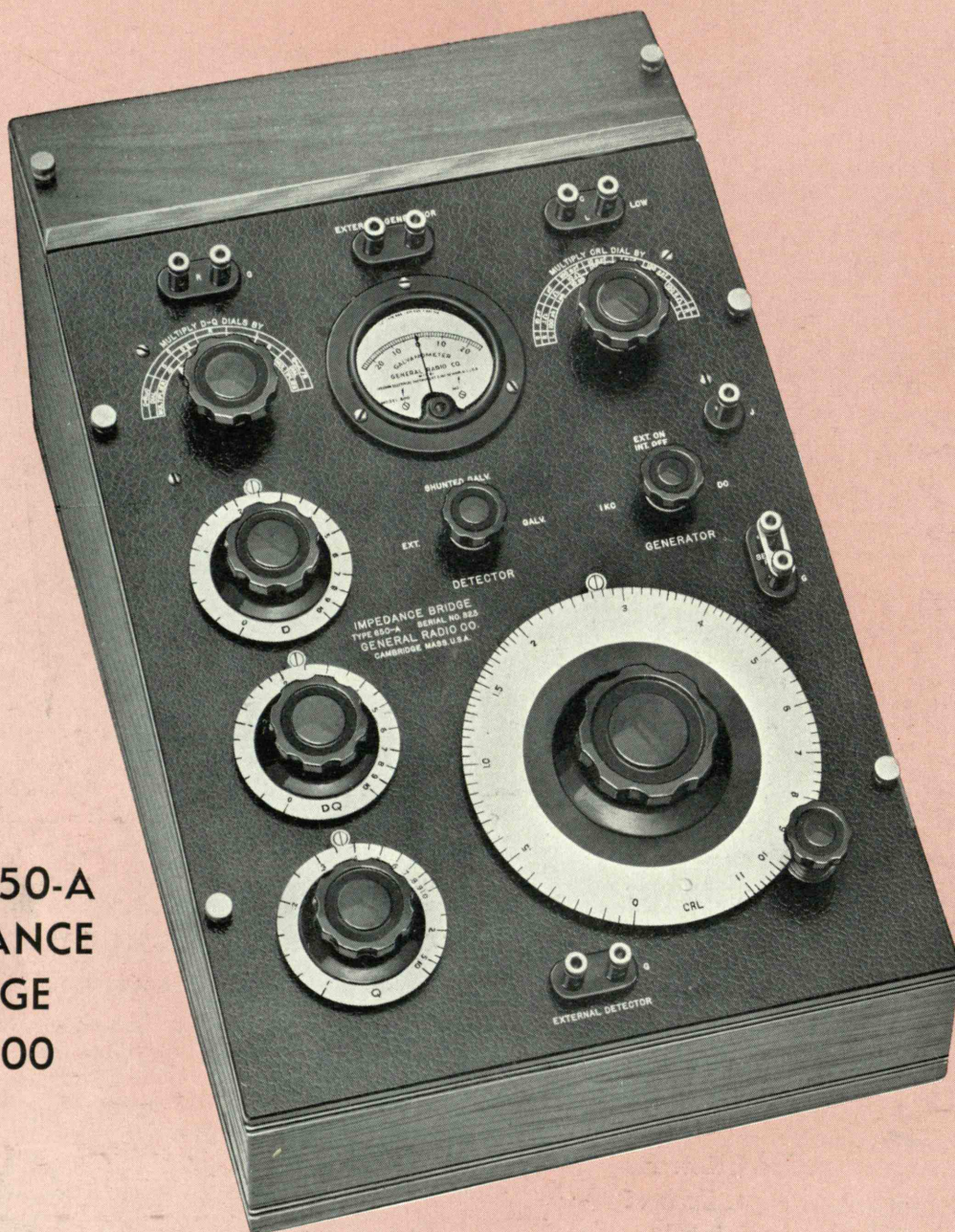
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